

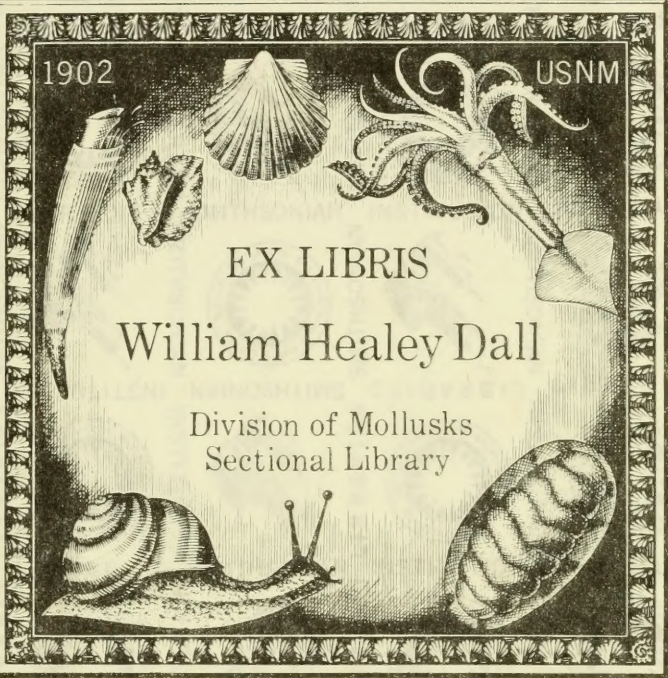
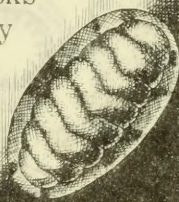
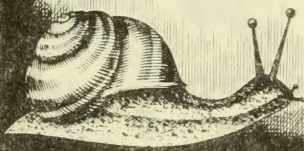
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JOURNAL OF MALACOLOGY

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P R E F A C E .

The end of 1895 will see the completion of the fifth year of the publication of the JOURNAL OF MALACOLOGY, which has now reached its fourth volume, the parts issued in 1892 and 1893 forming Volume II.

Judging from the gratifying letters received from time to time, the present volume in no wise falls short of its predecessors, and as Acting Editor, I must sincerely thank those members of the staff on whose efforts the success of the JOURNAL has been largely dependent, as well as the literary and artistic contributors during the year. The care expended by the printer on the production of the work should also be made mention of.

It is contemplated that after this number, the BIBLIOGRAPHY should be put into the hands of Mr. E. R. Sykes, who has kindly offered to superintend the whole of the work in connection with this department.

Nothing more remains to be said except to express the hope that in 1896 still better work may be aimed at and accomplished.

WILFRED MARK WEBB.

CONTENTS OF VOLUME IV.

	PAGE
Oysters as Disseminators of Disease	
John C. Thresh, M.B., D.Sc., D.P.H.	1
Description of a New Species of <i>Limax</i> from Ireland	
Walter E. Collinge, F.Z.S.	4
<i>Amalia parryi</i> , a supposed new species ..	Walter E. Collinge, F.Z.S. 7
A Mess-mate of <i>Limnaea stagnalis</i> ..	George Bailey, F.R.M.S. 8
Notes upon the Generic Terms <i>Cassidaria</i> and <i>Oniscia</i>	
Edgar A. Smith, F.Z.S.	11
The Di-myarian Stage of the "Native" Oyster	
Wilfred Mark Webb, F.L.S.	15
Current Literature	19, 39, 60, 77
On the Synonymy of <i>Plutonia</i> , <i>Stabile</i> ..	(BV) ² 29
Sinistral Shells and Superstition ..	A. H. Finn 29
New Pleistocene Mollusca from Crayford ..	A. S. Kennard 29
A Pleistocene Deposit containing Shells at Chelmsford ..	W. M. W. 30
<i>Succinea elegans</i> from the Ilford Brick-earth ..	W. M. W. 30
A Train Stopped by Snails ..	.. 30
Inter-breeding of Type and Variety of <i>Helix aspersa</i> ..	G. T. Rope 30
The Mollusca of Essex ..	W. M. W. 30
Proceedings of Societies .. ..	.. 31
Editors' Notes	31, 52, 68, 86
The Habits of the Young <i>Sepia</i> ..	Francis A. Bather, M.A., F.G.S. 33
New British Marine Shells ..	J. T. Marshall 35, 67
Cooke's Molluscs ..	W. M. W. 40
Tryon's Manual ..	E. R. S. 42, 60
<i>Veronicella</i> in Central America ..	W. E. C. 46
Dall's Tertiary Fauna of Florida ..	W. E. C. 46
Habits of the Agnatha ..	Wilfred Mark Webb, F.L.S. 50
On the specific identity of <i>Papuina hedleyi</i> and <i>P. canefriana</i>	
E. R. Sykes, B.A., F.Z.S.	51
Variations in Radulae ..	George Bailey, F.R.M.S. 52
Mollusca of the Oriental Region ..	Charles Hedley, F.L.S. 53
Notes on a few of the less-known British Marine Mollusca	
George W. Chaster, F.R.C.S.	56
Shells and Superstitions ..	J. Jennings 67
Importation of Foreign Land Molluscs ..	Frank Hughes 67
The Toheroa and its Enemies ..	Samuel Webb 67
<i>Purpura coronata</i> , Lam., in the West Indies	
Rev. A. H. Cooke, M.A., F.Z.S.	69
Notes on the Terrestrial Molluscan Fauna of New	
Caledonia ..	E. R. Sykes, B.A., F.Z.S. 71
The British Species of <i>Testacella</i> ..	Wilfred Mark Webb, F.L.S. 74
Locality of <i>Clausilia recondita</i> , Sykes ..	E. R. S. 73
<i>Arion hortensis</i> , var. <i>caeruleus</i> ..	Walter E. Collinge, F.Z.S. 73
Note on <i>Scacchia eddystonia</i> , Marshall	Geo. W. Chaster, M.R.C.S. 73
Taylor's Monograph, Part II. (Review) ..	W. M. W. 77
Godwin-Austen's Mollusca of Andaman and Nicobar Islands	E. R. S. 81
Pilsbry and Stearns' Marine Molluscs of Japan ..	E. R. S. 82
List of Contributors to Volume IV. ..	.. 86
Index to Volume IV. ..	.. 87

T H E

JOURNAL OF MALACOLOGY.

No. 1.

MARCH 30th, 1895.

Vol. IV.

OYSTERS AS DISSEMINATORS OF DISEASE.

JOHN C. THRESH, D.Sc., M.B., D.P.H., etc.

Editor of the Journal of State Medicine.

THE origin of the 'Oyster scare' which is so seriously affecting one of our great national industries, that of Oyster culture, appears to be known to few outside the medical profession, and many erroneous opinions are held with reference to the manner in which the Oysters cause Typhoid Fever. The two diseases which Oysters are believed to have helped to disseminate are Cholera and Typhoid Fever, both of which are now well known to be due to the entrance into the human system of certain organisms—Bacilli—peculiar to these diseases. Cholera cannot arise without the Cholera Bacillus, nor Typhoid Fever without the Typhoid Bacillus. It follows, therefore, that no article of food, including oysters, can cause either of these diseases unless the living bacilli are present. Such being the case, it is nonsense to talk about dead or stale oysters, or decaying food being the cause of either Typhoid Fever or Cholera. The freshest food, the freshest oysters, if contaminated with the specific bacilli, will cause one or other of these diseases, if partaken of by a susceptible person.

Oysters were first seriously suspected of causing Cholera, during 1893 when the disease was introduced several times into our ports. Shortly after this introduction, a number of cases of Cholera occurred in certain inland towns, which at the time could not be accounted for. At length, however, suspicion rested upon the Oysters which came from one of the ports and

from beds which were certainly contaminated with sewage. The full details, will shortly be published by the Medical Officer of the Local Government Board.

The first epidemic of Typhoid Fever attributed to the eating of Oysters occurred in October last in America. An outbreak of Typhoid occurred amongst the students of the Wesleyan College, Middletown, Connecticut, and its origin was fully investigated by Professor Conn. He found that on October 12th, the several fraternities of students had held their annual invitation supper. The attacks were limited to three fraternities who alone had partaken of oysters. Certain visitors had sat at their tables, and it was discovered that several of these had also been attacked. At the same time an outbreak of Typhoid Fever occurred at Amherst College, and it was found that the students there had had a supper on the same evening, and had eaten oysters from the same source, as those supplied to the Wesleyan College. Professor Conn's investigations seem to prove conclusively that the Typhoid germs had been conveyed by the oysters, and fortunately he was able to shew how the bacilli gained access to the oysters. The bi-valves in question came from a fresh-water estuary in which they had been laid to fatten and within 400 feet of where they were laid was the outfall from a sewer from a private house, in which house there were two patients suffering from Typhoid Fever. As the bacilli abound in the excreta of such patients, they would be discharged with the sewage near the oyster beds: some of them were received within the shell of certain of the oysters and so were conveyed into the alimentary canal of those who afterwards suffered.

When these details were published in the English Medical papers, an epidemic of Typhoid Fever was in progress in the West End of London which quite baffled the investigations of the Medical Officers of Health. Suspicion at once rested upon Oysters as a probable cause, and soon evidence was forthcoming that tended to incriminate them, and on January 12th Sir W. Broadbent, Physician to the Prince of Wales, published in the *British Medical Journal*, details of a series of cases, which he said he considered it his duty to make known, and which had convinced him that Oysters were capable of disseminating Typhoid Fever. Other cases have since been published and the evidence is now such as to bring conviction to any unbiassed mind.

Many (chiefly interested) persons have urged that Oysters

cannot convey Typhoid Fever because the Typhoid organism has not been proved to be capable of living in salt water. This is quite a mistake, for Professor de Giaxa, in the Bacteriological Laboratory at Naples, found that when Typhoid Bacilli were introduced into sea-water, they at first multiplied rapidly, but afterwards gradually died. Many, however, were still present on the ninth day. Cholera Bacilli disappeared more rapidly, the rate at which they decreased being dependent upon the number of other, non-pathogenic, organisms also present. Experiments were also made with oysters and other shell fish by inoculating them with the microbes of Cholera and Anthrax. After the shell fish had been replaced in sea water it was found that the microbe had disappeared in six hours. No experiments, with the Typhoid Organisms, appear as yet to have been made on these lines. It has, however, been pointed out that although the organisms introduced within the shells speedily die, that those which may be adherent to the edge of the shell may survive some time, and would be introduced into the oyster during the process of opening. Professor Crookshank, of King's College, who has recently made a series of bacteriological experiments with Oysters from a certain bed, says, that whilst the danger has been exaggerated, yet he is "convinced that it is quite possible that just as unboiled milk mixed with typhoid-infected water may distribute typhoid fever amongst the consumers, so also the liquid of uncooked oysters may be the means of conveying typhoid fever, if water infected with typhoid fever is imprisoned between the valves of the oyster."

The investigations which have been made by the special correspondent of the *British Medical Journal* and by well-known Medical Officers of Health prove conclusively that in several localities, sewage is discharged in dangerous proximity to the beds on which oysters are cultivated, and it is to be hoped that now that attention has been called to the matter, that this source of danger will speedily be removed. The Local Government Board, fully alive to the danger, has ordered an enquiry to be made, upon the possibility of Cholera and Typhoid Fever being conveyed by Oysters and other Molluscs which are consumed in an uncooked condition.

The scare has had a most serious effect upon the oyster industry, and no doubt will continue to affect it, until the public is assured that all possible precautions have been taken to prevent the pollution by sewage of all waters in which Oysters and other such Molluscs are bred or fattened.

DESCRIPTION OF A NEW SPECIES OF SLUG OF THE GENUS LIMAX, FROM IRELAND.

By WALTER E. COLLINGE, F.Z.S.,

*Demonstrator of Zoölogy and Comparative Anatomy,
Mason College, Birmingham.*

SOME short time ago¹ I briefly described a specimen of *Limax* which I had received from Mr. James N. Milne, of Culmore, Derry, Ireland, which I thought to be sufficiently distinct, anatomically and otherwise, from any other known species, to rank as a species.

Mr. Milne has been good enough to procure for me another example from the same locality—viz., Rathmullan—and one from Walworth, Co. Derry, both of which confirm my previous diagnoses. I now wish to describe and figure the same, which I am naming *Limax hedleyi*, after Mr. Charles Hedley, F.L.S., the distinguished malacologist, of Sydney, N.S.W.

***Limax hedleyi*, sp. nov.**

Ground colour chocolate black, with a light or yellowish-brown stripe on the keel, which is slightly interrupted anteriorly. The tentacles and fore part of the head are minutely spotted with brown. The ventral edges of the mantle and the parts of the body covered by the same are of a dirty white colour covered by irregular sepia dashes. There are no traces of banding. The region of the pulmonary orifice is distinct, standing out as a faintly-marked circular margin. Foot-fringe very dark sepia; foot-sole with lateral sepia-coloured planes and a white median plane. Keel very prominent, posteriorly attenuated. Generative orifice immediately below, and posterior to the right inferior tentacle.

Length 136 millimetres.

Habitat.—Rathmullan, Co. Derry, Ireland. (James N. Milne).

Anatomy of Generative System.

The vestibule is indistinct, being formed partly by the terminal portion of the penis and free oviduct. The penis commences as a narrow tube dilating into a bulbous portion at about the first third of its length ; from here it is a wide, thick, muscular walled organ, folded upon itself so as to form a spiral.

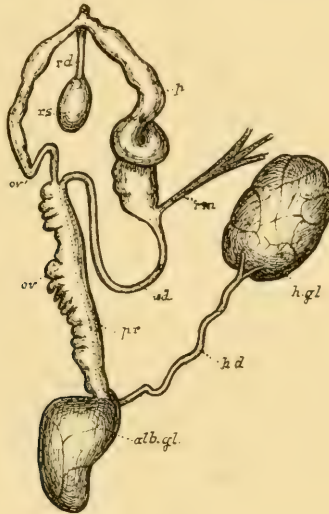


Fig. 1.—Generative system of *Limax hedleyi*, Cllgc.

alb. gl.—Albumen gland.
 h. d.—Hermaphrodite duct.
 h. gl.—Hermaphrodite gland.
 ov.—Oviduct.
 ov'.—Free oviduct.
 p.—Penis.

pr.—Prostate.
 r. m.—Retractor muscle.
 r. s.—Receptaculum seminis.
 r. d.—Receptacular duct.
 v. d.—Vas deferens.

The vas deferens is almost as long as the penis, of which it is a direct continuation ; at the junction of the two organs a large retractor muscle is attached. The free oviduct is much shorter than the penis, and consists of a narrow tube, which, previous to its joining with the oviduct, makes a sharp loop (fig. 1), which was characteristic of the three specimens dissected. The oviducal portion (fig. 1, *ov.*) of the common duct is richly convoluted, becoming almost filiform at about its middle third ; the prostatic portion (fig. 1, *pr.*) is a long, narrow tube, externally slightly pigmented. The receptacular duct, unlike that in *L. maximus*,

opens separately from the penis, so that one might very correctly speak of the portion into which the free oviduct, penis, and receptacular duct open, as a vestibule. The duct is quite distinct from the oval receptaculum seminis, which is about the same length as the duct. There is a large albumen gland. The hermaphrodite duct is long and not convoluted; it leads from the hermaphrodite gland, a large, oval-shaped body and is formed by the coalescence of two smaller ducts.

It may be questioned if it is worth while separating this form from *L. maximus*. I think it is for the following reasons:—

1. There are a number of very important differences in the form of the generative organs, constant in the three specimens examined, which distinctly separate *L. hedleyi* from *L. maximus*.

2. Judging from the specimens which I have seen, it is easily recognised by its external appearance as being distinct from *L. maximus*.

3. In studying the fauna of a country, isolated like Ireland, it is very important that varieties of any slug which appear constant, should be carefully noted, and if on examination it is found that there are anatomical differences which are constant in examples from different localities, it seems to me the best course to adopt, is to describe and name such.

4. That *L. hedleyi* is a form of *L. maximus* I readily admit, but it is sufficiently distinct to take specific rank. Such forms as *L. geographicus*, Ren., *L. subalpinus*, L. & P., *L. monticola*, Btg., are not more constant or better defined, yet there are few European malacologists acquainted with these slugs who would be bold enough to group them as varieties of *L. maximus*.

Limax hedleyi stands in the same relation to *L. maximus* as *Arion lusitanicus*, Mab., does to *A. empiricorum*, Fér.

AMALIA PARRYI, A SUPPOSED NEW SPECIES.

By WALTER E. COLLINGE, F.Z.S.,

Mason College, Birmingham.

IN the last number of the Journal¹ I described and figured the generative system of a species of *Amalia* from Santa Cruz, Tenerife, which I thought might be referred to *A. marginata*, Drap. The examples I compared it with are, I find, but poor specimens of Draparnaud's species: but I have recently received from Mr. F. Babor, of the Institute of Comparative Embryology of Prague, two examples in excellent condition, from which it is at once evident that I am wrong in classing the Tenerife specimens under this species. Mr. Babor suggests that it is the variety *raymondiana*, Simr., of *A. gagates*, which is the same as *maderensis*, Ckll.³

I have compared it carefully with the descriptions of the above, and also with Cockerell's descriptions² of *A. fuliginosa* (Gould), *A. antipodarum* (Gray), and its varieties *pallida*, (Ckll.,) and *emarginata* (Hutton), all of which are less distinct from *A. gagates* than this: in fact, *maderensis* (= *raymondiana*) and all the above-mentioned forms seem to me to be only colour variations of *A. gagates*, and I think both externally and internally there are sufficient points of difference in the Tenerife specimen to separate it from *gagates*, chiefly in the form of the oviduct and free oviduct, sperm duct, receptaculum seminis, and hermaphrodite gland. I shall, therefore, name it after Lieut.-Colonel G. S. Parry, to whom I am indebted for the specimens.

¹ Journ. Malacology, 1894, vol. iii., pp. 70-73.

² Nova Acta, 1891.

³ Ann. Mag. Nat. Hist., 1891, p. 334.

⁴ Ibid, p. 339-40.

A MESS-MATE OF LIMNÆA STAGNALIS.

By GEORGE BAILEY, F.R.M.S.

SOME time ago I had a number of *Limnæa stagnalis* put into a bell-glass and kept alive for purposes of observation. They were obtained from a small, obscure, pond south of Croydon, in Surrey. The only special features noticeable about the shells were their more than usually eroded condition, and the distinct white mark on the last whorl near the columella. The molluscs in confinement were very active. This seemed the more remarkable because they were infested about the head and mantle with what appeared to the naked eye like parasites. The *Limnææ*, however, gave no signs of discomfort, in spite of the host of "hangers on."

When detached and observed under a 1 inch objective, the appearance and form of these bodies resembled worms; and they moved after the manner of leeches, by attaching themselves to the glass cells, and did not attempt in any way to swim freely. On examining one of them under a $\frac{1}{5}$ inch objective, it soon became evident that the subject of inquiry was a naïd worm.

One species of naïd is said to have parasitic tendencies, attaching itself usually to *Limnæa*, and feeding on animalcules. Manifestly the example under consideration was living as a commensal with *Limnæa stagnalis*; and it answers fairly well to the description of *Chatogaster vermicularis* given by Claparède, Grube, and others. Johnston, in his "Catalogue of Annelids," describes the genus *Chatogaster*—"Body cylindrical, truncate in front, eyes none, mouth terminal, barbed underneath, bristles all forked spineti." Various synonyms are used by different authors, evidently describing the same worm—e.g., *Naïs vermicularis*, *Naïs diaphana*, *Chatogaster limnæa*, *Chatogaster diaphana*, and *Chatogaster vermicularis*.

In all naïd worms, it appears that the sexes are distinct, and that propagation is both by ova and spontaneous transverse division. Dr. W. B. Carpenter gives a somewhat minute account of the remarkable process of the non-sexual multiplication of these creatures. A bud is thrown out between two rings near the middle of the body, and ultimately developes into a distinct individual. Dr. Williams, in his Report of the British Annelida presented before the British Association in 1851, declared "with deliberate firmness that there is not one word of truth" in the descriptions which Prof. Owen, Dr. Carpenter, and others have given of the reproduction of naïd worms by a process of fission.



FIGURE 1. *Chatogaster vermicularis*, just after division has taken place. Shewn in optical section from the under side.

This confident assertion by such an acknowledged authority is, to say the least, very surprising. For while examining *Chatogaster vermicularis* under the microscope, I undoubtedly saw the process completed. I did not make a sketch of the appearance *before division*, but I noted very carefully certain facts observed. Although the constriction near the middle of the body was very decided, and the existence of two stomachs very evident, it was equally clear that the alimentary canal was not divided, and that minute portions of food passed through the

anterior portion of the worm into the stomach posterior to the constriction. At length the worm divided while still under observation, and became two worms, presenting the appearance represented in Fig. 1. Comparing the new worm with the original, it was seen that the mouth of the former was yet imperfect, time being required for the further development.



FIGURE 2. A group of setæ from *Chatogaster vermicularis*, enlarged.

There were twelve clusters of bristles, or setæ, arranged as shown in Fig. 1, on each worm; and these setæ were instruments used as hooks for the purpose of hanging on to the body of the mollusc. Being forked hooks (Fig. 2), they were well adapted for this purpose. As I saw *Chatogaster*, it was clinging to *Limnæa*, and waving itself to and fro continually, as though feeding or searching for food in the water.

The contents of the stomach of one of these divided specimens furnish interesting data respecting the food of *Chatogaster*. Most numerous was a quantity of oval bodies—transparent sacs filled with chlorophyll grains, doubtless unicellular plants. There was a number of flat circular organisms, of a deep brown colour, which might be diatoms with the endochrome not destroyed. Several species of diatoms (Fig. 1) were nicely cleaned and very perfect, especially *Navicula* and *Cocconema*.

NOTES UPON THE GENERIC TERMS CASSIDARIA AND ONISCIA.

By EDGAR A. SMITH, F.Z.S.,

British Museum (Zoölogical Department), London.

BOTH of these genera for many years found general acceptance, until the appearance of the Manuals by Philippi and the Messrs. H. and A. Adams. Tryon, who had an aversion to upsetting what *he* considered established names, employs both of them, and they likewise appear in Woodward's Manual. On the other hand, they are rejected by the Messrs. Adams, *Galeodea* and *Morum* being respectively substituted. Philippi rejects *Cassidaria* in favour of *Morio*, and employs *Oniscia*; and in the latest Manual by Fischer, the same course is adopted. Seeing this great divergence of opinions, I thought it would be useful to place on record the result of a further independent investigation. I will therefore proceed to discuss these two genera separately, commencing with *Cassidaria*.

Cassidaria.

Herrmannsen, Philippi, Fischer, Watson and Chenu give the date of Lamarck's *Cassidaria* as 1812. This is not correct, for, although the French term "Cassidaire" appeared in that year, but without one word of description, it was not until 1816 that the Latinized form, *Cassidaria*, was employed. In the explanation of plate 405 of the *Encyclopédie Méthodique*, which was the work of Lamarck himself, and was published in 1816, the term *Cassidaria* is there applied to the well-known *Cassidaria tyrrhena*. There is, however, no generic description whatever, and, apparently, the genus was not properly characterized until 1822, in the seventh volume of the *Syst. Anim. sans Vert.*, p. 214.

However, if 1812 were admissible as the date of this genus, it could not be retained, as two other properly characterised

genera, one of which is tenable, have precedence, namely, *Morio*, Montfort, and *Galeodea*, Link.

The Rev. R. Boog Watson² rejected *Morio* in favour of *Cassidaria*, because "*Latreille* used that name in the same year, and, as I believe, with acceptance, for a group of Coleoptera." If Mr. Watson had looked up *Latreille*'s description,³ he would have found that he originally wrote his genus *Morion*. He did, however, subsequently⁴ use the term *Morio*, which has been, and is still, generally employed by Coleopterists. As there is a Latin word *morion*, with a signification different from that of *Morio*, there really was no occasion for him to make the change. Under any circumstances, Montfort's name should take precedence, and it would seem to me advisable for the Coleopterists to revert to the genus *Morion* as first of all written by *Latreille*.

Mr. Watson also rejects Link's name *Galeodea*, published in 1807, because "*Galeodes* had been already employed by Martini in 1771 for his group of *Semicassis*, in which he included *Cassidaria echinophora*, Linné, the type of Link's genus. The same name, too, was used by Olivier in 1791 for a genus of Arachnida, and by Bolten in 1798 for a group of *Pyrula* and *Purpura*."

Although *Galeodea* is not absolutely identical with *Galeodes*, it evidently has a similar derivation, and therefore I quite agree with Mr. Watson in rejecting it.

The case with *Morio*, however, is different, and I do not see how we can avoid using it, if we pay attention to the usually accepted "law of priority." *Cassidaria*, too, also included species of "*Tritoniide*," *Cassis*, and *Oniscia*, and it was not until 1824, two years after it was properly founded by Lamarck, that it was assigned its present limits by Sowerby.⁵ Moreover, if we accepted 1822 as the date of *Cassidaria*, it could not be used, as *Echinora* of Schumacher has five years' precedence.

With regard to the signification of the terms *Morio* and *Morion*, respectively used by Montfort and *Latreille*, we have no guidance. According to Smith's Latin Dictionary, *morio* signifies a fool or jester; *morio* or *morion* a dark brown gem;

² Gasteropoda of the "Challenger," p. 410.

³ Considér. gén. Crust., &c., 1810, pp. 159 and 425.

⁴ Cuvier's Règne Anim., vol. iii., p. 189 (1817).

Gen. Recent and Foss. shells Number xxiii. (1824).

and morion, a narcotic plant. As neither of these words appear to have any significance in connection with either the group of shells or beetles in question, we are at liberty, I think, to make a definite suggestion with regard to their future use. I would therefore suggest that morio be retained for the Molluscan genus, and morion for the group of Beetles, unless the Coleopterists prefer to use a new name, supposing there is no synonym available.

The synonymy of *Morio* is as follows:—

MORIO, Montfort.

- 1807—Galeodea, Link (non Galeodes Olivier, 1791), Beschreib. Natur. Samml. Thier. Rostock, Abth. 3, p. 113. Type and only species quoted, *G. echinophora*.
- 1810—Morio, Montfort, Conch. Syst., vol. ii., p. 478, type and only species quoted, *M. echinophorus*.
- 1812—Cassidaire, Lamarck, Extrait du Cours de Zool., p. 119. Name only.
- 1816—Cassidaria, id, Ency. Méthod. Name only on explan. of plate 405.
- 1817—Echinora, Schumacher, Essai nouv. Syst. vers test, pp. 75, 249. Type and only species quoted, *E. tuberculosa* (= *echinophora*).
- 1822—Cassidaria, Lamarck, Anim. Sans Vert., vol. vii., p. 214. First species quoted, *C. echinophora*; other species belong to *Triton*, *Cassis*, and *Oniscia*.

Oniscia.

The term *Morum*, of Bolten, being a mere catalogue name, and unaccompanied by any description, must, of course, be disregarded. In describing *Lambidium*, Link places *Morum* in the synonymy, and, although it may be equivalent to *Lambidium*—and, if so, it is unfortunate that Link did not adopt it—we are hardly in a position to resurrect it ourselves in preference to *Lambidium*. The generic name *Oniscia*, which has been in general use for many years, cannot be employed, if we pay any regard to the “law of priority.” The remaining names, enumerated below, were proposed merely as subgenera, and, in my opinion, are not worthy of retention. *Oniscidia*, a mere typographical error for *Oniscia*, differs from *Lambidium* in having the

surface cancellated and the spire a little more acuminate: *Herculea* has the "inner lip sulcated, not granulated;" and *Plesioniscia* has not been characterised. The three divisions, *Lambidium*, *Oniscidia*, and *Plesioniscia*, contain species from three different geographical areas. The first includes *L. oniscus*, *L. lamarchii*, and *L. strombiforme* (the last two possibly vars. of *oniscus*), from the West Indies, and perhaps *L. ponderosa*; the last contains *L. tuberculosum* and *L. xanthostoma*, from California and the Galapagos Islands; and *Oniscidia* includes *L. cancellatum*, *L. grande* (perhaps a var. of *cancellatum*), *L. dennisoni*, *L. exquisitum*, *L. macandrewi*, and *L. cithara*, from the China Sea, Sooloo Sea, and the Ki Islands, West of Papua.

The locality, "Guadeloupe," assigned to *L. dennisoni* (Tryon, Man. Con., vol. vii., p. 282), seems to me very doubtful, and it is very possible that a specimen of *L. lamarchii*, which is a West Indian form, may have been mistaken for that species.

I am somewhat doubtful with regard to the position of *L. ponderosum*, but I certainly cannot agree with Tryon in considering it synonymous with *L. exquisitum*, nor has *L. grande* any relationship with that species, being, if not distinct, a variety of *L. cancellatum*.

LAMBIDIUM, Link.

- 1798—Morum, Bolten, Cat. Mus. Bolten. Without description.
- 1819—,, ,, op. cit. ed 2, p. 38.
- 1807—*Lambidium*, Link, Natur. Samml. Rostock, Abth. 3, p. 112. Type and only species quoted, *L. oniscus*.
- 1824—*Oniscia*, Sowerby, Gen. Rec. and foss. shells, Number xxiv. pl. 233. Three species quoted—1, *O. cancellata*; 2, *O. oniscus*; 3, *O. cithara*, a fossil species.
(Subgenera.)
- 1853—*Oniscidia*, H. and A. Adams, Gen. Rec. Moll., vol. i. p. 220.
- 1858—*Herculea* (Hanley), H. and A. Ad., op. cit., vol. ii., p. 621.
- 1884—*Plesioniscia*, Fischer, Man. Conch., p. 660.

6 This form is figured by Reeve as *O. cancellata* (Con. Icon. *Oniscia*, fig. 4).

ON THE DI-MYARIAN STAGE OF THE “NATIVE” OYSTER.

By WILFRED MARK WEBB, F.L.S.,

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It is, of course, a matter of common knowledge among malacologists that bivalves have been divided into sub-classes, according as the adult forms possess, two more or less equal muscles for the closing of their shells, one muscle—the anterior—much smaller than the other, or one—the posterior—only.

From this state of things it might be deduced, without great probability of error, that the last condition has been arrived at, from the first, through the second. This assumption, however, may be taken as proved, if one can find that during the early development of the one-muscle, or *mono-myarian* species, they pass through a two-muscle, or *di-myarian*, stage. Now, in the year 1883, Professor Huxley¹ showed that the oyster *must* pass through an undiscovered di-myarian stage, but none of our countrymen seem to have made any further observations on this fascinating case of “Recapitulation.”

The evidence brought forward by Professor Huxley is briefly this :—That there is but one adductor muscle closing the shell of the oyster, in the embryo, as in the adult mollusc; but while the larval muscle is *dorsal* to the alimentary canal, and is consequently the *anterior adductor* (Figs. A and B, *a. add.*), that in the adult, being on the *ventral* side of the intestine, is clearly the *posterior adductor*. Therefore, the muscles being different ones at different ages, and the oyster not being able to do without any muscle at all, it stands to reason that there must be a time when both are present, one “rising,” so to speak, while the other is “on the wane.”

¹ “Oysters and the Oyster Question” [a lecture delivered at the Royal Institution, May 11, 1883, with additions], by T. H. Huxley. “*The English Illustrated Magazine*,” 1883, p. 112.

² In Dr. Jackson's paper, p. 299, the terms are accidentally reversed.

Seven years later Dr. Robert Tracy Jackson³ described and figured a stage in the American oyster, in which the two muscles (Fig. C, *a. add.* and *p. add.*) were clearly to be made out. The embryos in question were examined after attachment, in the case of the experiment, on a strip of glass, which had been exposed in an earthenware drain-pipe partially sunken in the sand at low-water mark. No spat growth had taken place.

Last summer, when the writer had the privilege of working in the Marine Biological Laboratory which the County Council of Essex fitted up at Brightlingsea in connection with some

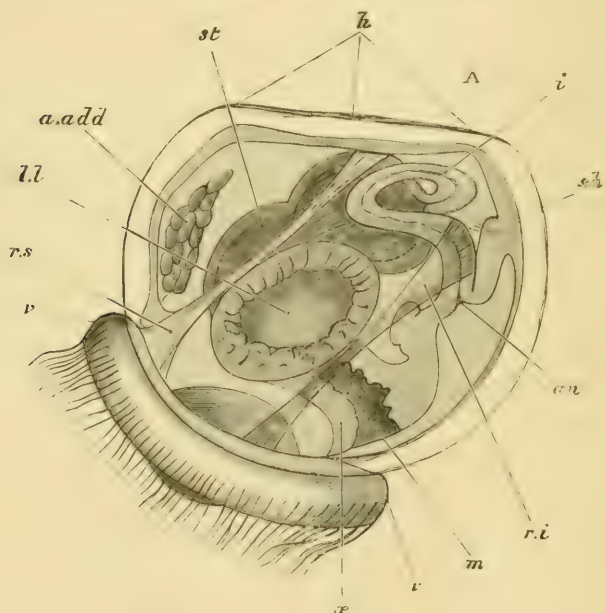


FIGURE A. An embryo of the European oyster, *Ostrea edulis*, L., seen in optical section from the left side. *a. add.*, anterior adductor muscle; *an.* anus; *h.* hinge of shell; *i.* intestine; *ll.* *r.l.* left and right lobes of the "liver;" *æ.* œsophagus; *r.s.* *r.i.* superior and inferior muscles, which retract the velum; *st.* stomach; *v.* velum, with its long cilia. (After Huxley.) Reprinted from the *English Illustrated Magazine*.

experiments in Oyster Culture, he bethought himself of the di-myarian stage, but had to content himself with larvæ from

³ "The Phylogeny of the Pelecypoda," by Robert Tracy Jackson, Mem. Boston Soc. Nat. Hist., vol. iv., 1890, p. 300, pl. xxiv., figs. 1 and 2. N.B.—The discovery of the di-myarian stage was announced in Proc. Bost. Soc. Nat. Hist., vol. xxiii. (1888).

the "sick" oysters kindly brought to him from time to time, as the lateness and smallness of the second "fall of spat"—the first having been destroyed by an unexpected spell of cold weather—made it almost useless to attempt the capture of older embryos which had left the parent's shell, though mica plates were prepared for the purpose.

Nevertheless, it was possible to make out in the later "white spat" and in the "black spat," what appears to be a posterior adductor muscle (Pl. I., Fig. 1, *p. add.*), which occupies a spot just ventral to the anus, and is indicated, though not labelled, in Professor Huxley's drawing (Figure A). In Horst's Figure 4, also, the spot is surrounded by a continuous outline, and appears even more definitely, but is not mentioned nor described in the letterpress.

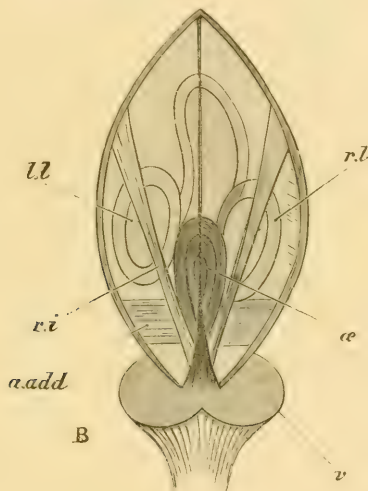


FIGURE B. The same as figure A, but seen from a point to its south-east. Lettering as before. (*After Huxley.*)

Now, it was not to be expected that the posterior adductor, if present before the attachment of the oyster, would be easy of identification, or it would have been recognised long ago; but in the light of the Brightlingsea specimens, those at the Royal College of Science were examined through the kindness of Professor Howes. The series there includes a slide made by Dr.

4 R. Horst. "On the Development of the European Oyster, *Ostrea edulis*, L." Q. J. Mic. S., n.s., vol. xxii., 1882, plate xxvii., figure 12.

Horst, from which Figure A was probably taken, and the specimens show the general anatomy in greater detail than the writer's preparations, enabling one to locate the structure alluded to, with greater distinctness. In another fine preparation, looked at from the mouth side, the outline of the chamber, into which the other end of the alimentary canal opens, can be made out, together with a transverse thickening, slightly striated, on the side towards the mouth in the position that should be occupied by the posterior adductor (Pl. I., Fig. 2, *p. add.*).

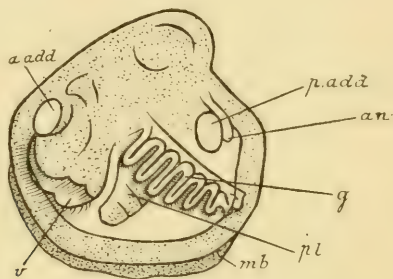


FIGURE C. An embryo of the American oyster, *Ostrea virginiana*, Lister, after attachment, seen as Figure A. *g.* gill; *m.b.* mantle border; *pl.* palps; *p. add.* posterior adductor. Other lettering as in Figure A. (After Dr. Jackson.)

The conclusion is, therefore, that the structure just described corresponds with that seen from the side view, and represents the posterior adductor in an incipient condition. During the next summer the writer hopes to be able to trace its development till it becomes functional, and spat growth begins.

CURRENT LITERATURE.*

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

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2nd Series (Pulmonata), part 33a—introduction, etc., to vol. ix., pages i. to xlviii., plates 41-71, part 36, pages 161-366.

[These parts will be reviewed in detail later.—Ed.]

Simroth, H.—Bronn's Klassen und Ordnungen des Thier-Reichs. Bd. iii. Mollusca. Lief. 15-17 (containing pp. 337-400 and pl. xv.-xvi.). Leipzig, 1894 (issued Jan., 1895).

Dr Simroth makes steady progress with this invaluable work of reference. The present part commences with an appendix to the *Polyplacophora*, bringing the account of this group abreast of current literature up to July, 1894. To this subject the plates also refer. He then proceeds with the *Scaphopoda*, the morphology of which occupies the rest of the part. Several interesting figures of the different forms of the shell are given and, to demonstrate that Dr. Simroth is "up to date," we may mention that the figure of *Schizodentalium*, only published last October, is reproduced.

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* An asterisk denotes that a reference has not been verified.

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Contains account and figures of the anatomy of *Sitala anthrophagorum*, Hedl., *Partula macleyi*, Braz., *Papuina zeno*, Braz., *P. chapmani*, Cox, *P. gurgusti*, Cox, *Trochomorpha nigrans*, Sm., *Rhyssota flyensis*, *Chlorites rehsei*.

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[Will be reviewed in the next part.—ED.]

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W.E.C.

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- Sturany, R.**—"Zur Molluskenfauna der europäischen Türkei." Ann. Hofmus. Wien., ix., 369-90, pls. 18-20.
- [See also under "Systematic," and supplementary paper by Simroth, "Systematic."]
- Taylor, J. W.**—"Succinea oblonga in Jersey." J. of C., vii., 1894 (pub. 1895), p. 414.

SYSTEMATIC WORK.

- Ancey, H. C. F.**—"Description d' une nouvelle Hélix d'Algérie." Le Naturaliste, No. 191, 1895, pp. 44-45.
- Anon.**—Note on *Unio oregonensis*, Lea. Naut. viii., pp. 116-118.
- Babor, J. and Kostal, J.**—O nově ceski Campylaei, Sitz. Gesel. d. wiss. Math., Nat. Prague, 1894, pp. 1-10, pl. xiii.
- A description of *Helix (Eucampylaea) ichthyomma*, Held. var. nov. *ochroleuca*. The shell is figured and described and also the generative anatomy.
- Bachmann, Otto, and Gredler, Vincenz.**—"Zur Conchylien fauna von China." Ann. des. H. K., Naturhist. Hofmuseums Wien, ix., pt. 3-4., 1894, pp. 415-429 and 27 figures.
- Six new species of land and freshwater molluscs [*Limnaea subperegri*, Gr. sp. n., should read *L. subperegri*, pereger, as was pointed out by Mr. Bather, being an adjective of the third declension.] New species:—II. (*Fruticicola*) *adacnata*, Claus. recens, *Limn. subperegri*, *Cyclophorus cicatricosus*, *Ptychopoma humillimum*, P. juvenile. (See "Fauna.")
- Bergh, Rudolf.**—"Die Opisthobranchien." Bull. Mus. Comp. Zoöl., Camb., 1894, vol. xxv., pp. 125-233, pls. i.-xii.

This interesting volume forms one of the reports on the dredging operations carried out by the U.S. Fish Commission Steamer "Albatross" in 1891. The new species are:—*Eolida herculea*, *Himatella trophina*, *Tritonia diomedea*, *Tritonia exulans*, *Geitodoris immunda*, *Gargamella immaculata*, *Thordisa?* *dubia*, *Chromodoris agassizii*, *Tridachia diomedea*, *Doridium purpureum*, *Doridium diomedcum*, *Doridium ocelligerum*, *Navarchus enigmaticus*.

Bergh, R.—"Die Hedylien, eine Familie der kladhepatischen Nudibranchien." Verh. Ges. Wien, xlv. 4-12, pls. i.-ii.

New genus and species *Hedyle weberi*.

Bradshaw, Mrs. M. F.—"*Hamina virescens*." Naut. viii., pp. 100-101., pl. ii., fig. 15.

Bradshaw, Mrs. M. F.—"*Megatebennus bimaculatus*." Naut. viii., pp. 112-113.

Brazier, J. "On a *Patella* said to have been found on the Kermadec Islands." P. Linn. Soc. N.S. Wales, ix., 183-4.

Denies that *P. Kermadecensis*, Pilsbry, comes from this locality and re-names it *P. (Scutellastra) pilsbryi*.

Chaster, W.—"A new species of *Lepton* from Guernsey." Ann. Nat. Hist. (s. 6), xv., 248, L. *sykesii*; no figure.

Chaper, M.—"Note sur quelques *Unionidae* de Grèce." Mem. Soc. Zool. France, vii., 372-4, pl. vi.-vii.

The following so-called species are for the first time figured:—*A. quellenæ* (Drouet), *A. græca* (Dr.), *A. lepida* (Dr.), *U. pamisius* (Dr.), *U. messenicus* (Westerl.).

Clapp, G. H.—"Mollusks in Alleghany Co. Pens." Naut. viii., p. 110.
Several new records.

Clapp, G. H.—"*Zonites cellarius* [*Vitrea cellaria*] in Western Pennsylvania" (a note). Nautilus viii., p. 82 (introduced)

Dall, W. H.—"A new *Chiton* from California." Naut. viii., p. 90.

Dall, W. H.—"Description of a new species of *Doridium* from Paget Sound (*Doridium adelle*)." Naut. viii., p. 73.

Dall, W. H.—"Land shells of the genus *Bulimulus* in Lower California, with descriptions of several New species." P.U.S. Mus. xvi., 637-47, pl. lxxi.-ii.

B. (Scutalus) baileyi, *B. (Leptobyrsus) zeledoni*, *B. (L.) veseyianus*.

Dall, W. H.—"Notes on the Shells collected from the shores of the Great Lagoon, Watling Islands, Bahamas." Bull. Mus. Comp. Zool. Camb. 1894, xxv., pp. 113-24., 1 pl.

New species are *Venus leptalea*, *Tornatina parviplica* and (fossil) *Cerion agassizii*.

Dall, W. H.—"On a new species of *Holospira* from Texas." Naut. viii., 1894, p. 112.

Dall, W. H.—[Siberian Miocene; see "Palæontology."]

New sp.:—*Senecle stimpsoni*, *Siphonaria penjinæ*, *Conus okhotensis*, *Cerithium cymatophorum*, *Diloma (Chlorodiloma) ruderata*.

Ford, John.—A new variety of *Olivella granlis*. Naut. viii., pp. 103-104.

Gill, Thos.—"Rangia, the proper name of the Mactroid genus *Gnathodon*." Naut. viii., pp. 102-103.

Haller, B.—"Notes on (Poly) placophora." Abst. in J. R. Mic. Soc., 1894, pp. 670-671. Morphol. Jahrb., v. 1894, p. 24.

Hedley, C.—"On a Molluscan genus new to and another forgotten from Australia." Proc. Roy. Soc. Vict., 1894, pp. 197-200, pl. xi.

Mr. Hedley describes the occurrence in Australia of the genus *Lucapinella*. A new species, *L. pritchardi*, is described and figured. Another addition to the Australian fauna is *Scyllæa pelagica*, L., collected at Port Phillip.

Hedley, C.—[Mol. N. Guinea; see "Fauna."]

New species:—*Otopoma mactegregoriae*, *Sitala anthropophagorum*, *Papuina secans*.

Kobelt, W.—"Zweiter Nachtrag zur Fauna der Nassauischen Mollusken." Jahrb. Nassau, ver. xlvii., 83-9, pl. iv.

? New species:—*Unio* (*pictorum* var.) *battonensis*.

Martens, E. von.—"On *Dreissensia polymorpha*, Pallas." J. of C., vii., 1894 (Pub. 1895), pp. 415-416.

Points out that its specific name should stand.

Melville, J. C., and Ponsonby, J. H.—"Descriptions of Four New Species of Terrestrial Mollusca from South Africa." Ann. Nat. Hist. (s. 6), xv., 163-5, pl. xii.

Zingis delicata, H. (*Trachycystis*) *alcocki*, *Achatina churchilliana*, *Cyclostoma foveolatum*, *Natalina chaplini*, and *Dorcasia inluzana* are also figured.

Monterosato, Marquis de.—"Note sur le genre *Hagenmulleria*, de Bourguinat." J. de Conch. xlii., No. 2, 1894 (pub. 1895), p. 112-116.

Newton, R. Bullen.—[See "Palæontology." Madagascar fossils.]

The following new species of Mollusca are described and figured:—*Trochactonina richardsoni*, *Perna latoconvexa*, *Gervillia iraoensis*, *Lima iraoensis*, *Mytilus madagascariensis*, *Modiola angustissima*, *Corbula grandidieri*, *Pseudotrapezium ventricosum*, *P. depressum*, *P. elongatum*.

Pelseneer, P.—"Branchiate Pulmonates." Abst. in Jour. R. Mic. Soc., 1894, p. 670. Compt. Rend., Ac. Sci., Paris. v. 1894, pp. 357-358.

Pilsbry, H. A.—"New Forms of American Shells." Naut. viii., p. 109. *Gastrodonta* and *Somatogyris*.

Pilsbry, H. A.—"New Forms of Western Helices." Naut. viii., p. 81. (One new species.)

Pilsbry, H. A.—"New American Fresh-water Molluscs." Naut. viii., pp. 114-116.

Sargent, H. E.—"*Ferussacia subcylindrica* [*Cochlicopa lubrica*, Risso], and two new species in Jackson County, Alabama." Naut. viii., pp. 104-105.

Scharff, R. F.—"A supposed new Species of *Limax* from Ireland." Irish Nat., 1894, p. 261.

Simroth, H.—"Ueber einige von Herrn Dr. Sturany auf der Bulkanhalbinsel erbeutete Nacktschnecken." Ann. K. K. Natur. Hist. Hofmuseums., 1894, Bd. ix., pp. 391-4, figs. 1-11 T xix.

Three new species of *Agriolimax* are described and figures given of parts of their anatomy. The differences are so minute, and confined to one organ almost, that we doubt whether they can be regarded as good species. The three forms are named *Agr. turcicus*, *Agr. sturanyi*, and *Agr. murinus*.

W.E.C.

Smith, E. A.—"Descriptions of new Species of Land Shells from New Guinea." Ann. Nat. Hist. (s. 6), xv., 230-3, no fig.

Nanina amblytropis, *N. lissorhapha*, *Rhysota armiti*, *H. (Hadra) stirophora*, *H. (Dorcasia) subplicifera*, *H. (Chloritis) phamulla*, *Chl. pyrambigua*, *H. (Cristigibba) musgravei*.

Stearns, R. E. C.—[See "Fauna," Galapagos Is. Mol.]

The so-called new species have already been preliminarily described, but are now figured for the first time. They are :—*Onchidium leslei* (St.), *Nitidella incerta* (St.), *Littorina* (*Tectaria*) *galapagensis* (St.).

Stearns, R. E. C.—"On rare or little known Mollusks from the West Coast of North and South America, with descriptions of new Species." P.U.S. Mus., xvi., 341-52, pl. 1.

Chicoreus palma-roseæ mexicana is described. By the bye, is its name strictly "binomial"? *Tectarius atyphus* (St.) and *Uvanilla regina* (St.) are figured for the first time.

Sterki, von.—"*Vertigo morsei*, n.sp." Naut. viii., 89-90. From Kent County, Michigan.

Sterki, von.—"Two new *Pisidia*." Naut. viii., No. 9, pp. 97-100, pl. ii., figs. 1-13.

Sturany, R.—[See "Fauna."]

The following new species are described and figured :—*Clausilia* (*Alinda*) *distincta*, *Cl.* (*Papillifera*) *lophauchena*, *Planorbis* (*Gyrorbis*) *macedonicus*, *P. presbensis*, *P. paradoxus*, *Valvata rhabdota*, *Emmericia munda*.

Taylor, G. W.—"The present condition of Canadian Conchology." Ottawa Nat., viii. (1895), pp. 143-159.

Warren, Miss Amy.—"*Donax vittatus*, var. *truncatus*, Marshall, M.S." Irish Nat., vol. iv., Jan., 1895, p. 18.

Whiteaves, J. F.—"Notes on some Marine Invertebrates from the Coast of British Columbia." Quoted in Naut. viii., p. 84. A new *Pecten*.

PALÆONTOLOGY.

Bather, F. A.—"Cephalopod Beginnings." Nat. Sci., V., 1894, pp. 423-436. A criticism on the observations of J. M. Clarke.

Clarke, J. M.—"Cephalopod Beginnings." Amer. Geol. xv., 125-8.

Crick, G. C.—"Jurassic Cephalopoda from Western Australia." Geol. Mag., 1894, pp. 433-441.

Dall, W. H.—"A subtropical Miocene fauna in Arctic Siberia." P.U.S. Mus. xvi., 471-8, pl. lvi. [See "Systematic Work."]

Dall, W. H.—"Notes on Miocene and Pliocene of Gay Head, Martha's Vineyard, Mass." Amer. Journ. Sci., Oct., 1894, p. 1.

Frauscher, K.—"Nautilusse von Guttaring." Jahrb. des Naturhist. Landes-Mus. Kärnten, lxi. and lxii. (1895), pp. 185-207. 2 pls., 6 figs.

New species :—*N. tumescens* and *Aturia brunlechneri*.

Gregory, J. W.—"On a Collection of Fossils from the Lower Greensand of Great Chart, in Kent." Geol. Mag. (s. 4), II., 97-103.

No new species.

Hyatt, Alpheus.—"Phylogeny of an acquired characteristic." Proc. Amer. Phil. Soc. xxxii., pp. 349-647, 14 pls.

Based upon fossil cephalopods.

Kittl, Ernst.—"Die Gastropoden der Schichten von St. Cassian der Sudalpinen Trias," III. Theil Schluss. Ann. des. K.K., Natur. hist. Hofmuseums Wien. ix., part 2, 1894, pp. 143-277, 9 plates.

Mayer-Eymar, C.—"Coquilles fossiles des terrains tertiaires supérieurs." J. de Conch., xlii., No. 2, 1894 (pub. 1895). pp. 117-128, 2 plates to this and next paper.

Eleven new species of bivalves.

Mayer-Eymar, C.—"Coquilles fossiles des terrains tertiaires inférieurs." Loc. cit., pp. 129-130.

One new species of *Natica* and one of *Cyprea*.

Newton, R. Bullen.—"Note on some Molluscan Remains lately discovered in the English Keuper" (continued from p. 412). J. of C., vii., 1894 (pub. 1895), p. 413, 2 figs.

Newton, R. Bullen.—"On a Collection of Fossils from Madagascar obtained by the Rev. R. Baron." Quart. J. Geol. Soc., ii., 72- , pl. ii-iii.

A good account of previous discoveries and description of new species. (See "Systematic Work.")

*Schluter, Chen.—"Zur Kenntnis der Planer-Belemniten." Verhandl. Nat. Ver. Preuss. Rheinl., li.

*Schmeltz, J. D. E.—Schnecken und Muscheln in Leben der Völker Indonesiens und Oceaniens, Ein Beitrag zur Ethnoconchologie.

Read at Anthropol. Sect. Brit. Ass., Oxford, 1894. Leiden, 1894, 80., 43 p.

Simpson, C. T.—[Drift fossils from Toronto. See "Fauna."]

Tate, R.—"Note on the Tertiary Fossils from Hall Sound, New Guinea." P. Linn. Soc., N.S. Wales, ix., 213-4.

No new species.

*Ulrich, E. O.—"The Lower Silurian Lamellibranchiata of Minnesota in Final Rep. Geol. and Nat. Hist. Survey, Minnesota." Vol. vii., chap. vi., pp. 475-628, 8 pls.

Webb, Wilfred Mark.—"Pleistocene Non-Marine Mollusca from Walton-on-the-Naze." Essex Naturalist, vol. viii. (1894), pp. 160-162.

A list of 19 species collected by the late John Brown, F.G.S., of Stanway. It forms No. 1 of Museum Notes.

Zickendraht, Ernst.—"Notiz über einige Conchilien aus dem Tuffsand bei den Sperlingsbergen nächsts Moskau." Bull. Soc. Imp. Moscow, 1894, No. 2, pp. 275-276.

COLLECTING AND CULTURE.

Calderwood, W. L.—"Mussel Culture and Bait Supply, with reference more especially to Scotland." Macmillan and Co., 1895.

This is an interesting little work of 121 pages, calling attention to the gradually decreasing supply of mussels as bait, and to the best methods to be adopted to prevent the threatened decline of the line fishing industry of the North Sea. The first two chapters deal with the supply and demand of mussel bait, and with the geographical distribution and general character of the principal mussel beds of Scotland. The third chapter gives an account of the Natural History of the Mussel as a preliminary to technical details as to mussel culture and general treatment of "scalp." This is followed by an

important chapter on the "Bouchot" system of culture as practised in France and on the east coast of Scotland. The results, however, obtained at the home stations do not appear to have been altogether satisfactory.

Hedley, C.—"A Shell Hunt Forty Feet under the Sea." Naut. viii., p. 85-88.

An interesting account of collecting in diver's dress at Port Jackson.

Sterki, Von.—"On collecting *Pisidia*." Naut. viii., p. 113-114.

BIOGRAPHY.

Schuberg, August.—"Carl Semper," Arb. Zool. Inst. Würzb. Vol. x., 1895, pp. i.-xxii. Portrait and Bibliography.

NOTES.

Note on the Synonymy of *Plutonia*, *Stabile*.—In the notes to his Check-list of Slugs (Conchologist ii., p. 204) Professor T. D. A. Cockerell calls attention to the fact that the name *Plutonia* has also been used for a genus of Trilobites. In a foot note thereto, Mr. Collinge, assuming that the Trilobites had priority, proposes to substitute *Vitriplutonia* for the genus, and *Vitriplutoninae* for the sub-family. At Professor Cockerell's request I have looked up the references, and find that *Plutonia* stands for Mollusca, the synonymy being as follows:—

Plutonia *Stabile*: Atti Soc. Ital. Sci. Nat. vii. (1864) p. 121, *non*. Hicks 1868 (*nom. nud.*) Trilobita.

Viquesnelia Morelet: Notice Hist. Nat. Azores (1860) *non* Deshayes (1857) *nec* Fischer (1857) = *Plutonia* Morelet in litt. Type *V. atlantica*, Morelet, loc. cit., p. 139, pl. 1, fig. 1.

Vitriplutonia, Collinge, Conchologist ii. (1893) p. 204, note.

[The Trilobite is to be re-christened *Plutonides*.—Ed.]

(BV)²

Sinistral Shells and Superstition.—The following remarks on left-handed shells: as luck-bringers are extracted from a letter:—As to the "superstition," I heard it from one of the apothecaries at Port Blair, who told me that some natives of India in Rangoon, on hearing that he was ordered to Port Blair, begged him to send them a left-handed shell, if he could find any, as they believed that these secured great wealth, immunity from drowning and general good fortune (or long life) to their possessor.—A. H. FINN, Bridport, Pagoda Avenue, Richmond.

New Pleistocene Mollusca from Crayford.—Last year, while working at the Pleistocene deposits at Crayford, I had the good fortune to discover two species of mollusca not before recorded from that locality, viz.:—*Limax agrestis* and *Littorina rudis*. Both species were represented by a single example, now in the British Museum. *Limax agrestis* has already been recorded from the Pleistocene at Grays; while the example of *Littorina rudis* belongs to the brackish-water form still to be found in the Thames estuary.—A. S. KENNARD, Beckenham.

A Pleistocene Deposit containing Shells at Chelmsford.—At a meeting of the Essex Field Club on March 9th, papers were read (1) on the geology of a Brick pit at Chelmsford, by T. V. Holmes, F.G.S.; (2) on the bones of Elephas and other animals found in the pit, by E. T. Newton, F.R.S.; and (3) on the molluscan remains from the brick-earth, by Wilfred Mark Webb, F.L.S.—A preliminary list of eight species of land and fresh-water molluscs was given in the last paper.

Succinea elegans from the Ilford Brick-earth.—Among some specimens from Ilford lately put into my hands by Mr. Williment, of Brentwood, there is an example, *Succinea elegans*, Risso, a species not recorded from that locality in Woodward's "Pleistocene Mollusca of the London District."—WILFRED MARK WEBB, Brentwood.

A Train Stopped by Snails.—The following is quoted from *The Nautilus*, and came originally from the *Dépêche Tunisienne*, to which it was contributed by an engineer of the Tunis Railway:—"The train coming east from Suk-el-Arba last Thursday was two hours late, for a very singular reason. The road was literally covered with snails, the wheels of the locomotive crushing these molluscs into a pulp, which destroyed all adherence, and caused the locomotive wheels to skate, so to speak, in their places."

Inter-breeding of Type and Variety of *Helix aspersa*.—A pale yellow variety of *Helix aspersa* is not uncommon at Blaxhall, Suffolk, being most frequently met with in an old walled-in kitchen garden. In August, 1883, being desirous of obtaining a supply of this variety, I placed three or four adults in a large glass-fronted box in a greenhouse, hoping thus to secure and rear some of their progeny. To enable them to deposit their eggs in the usual way, the bottom of the box was covered with soil some two or three inches deep. On August 13th one of these snails paired with a specimen of the normal colour, which unfortunately had managed to get into the box, and on the 16th it laid a batch of eggs. These were hatched in due course, though, in this case, I omitted to note the interval which elapsed between laying and hatching. Though many died in various stages of growth, I managed to keep some of the young ones till late in the autumn of 1884, when the last died, being then hardly a third of the size of an adult of average dimensions. After the age of three months, their growth was extremely slow; in fact, from that period till they were 15 months old, there was scarcely any increase in size, and the shells had a stunted, unhealthy look. Perhaps under more favourable circumstances they would have thriven better; but being away from home a good deal at the time, I had to keep them in a tin box, so as to be able to take them about with me. They were fed on cabbage leaves—possibly an unsuitable diet. Contrary to what might be supposed, almost every one of these young snails was of the colour of the yellow parent.—G. T. ROPE, Blaxhall, Wickham Market.

The Mollusca of Essex.—I should be very glad to receive any records of Land and Freshwater Shells, and more particularly of Slugs (with the localities) taken in Essex, for my forthcoming list of the Non-Marine Molluscs of Essex in the "Essex Naturalist." Any information with regard to the occurrence in the County, of *Vitrea drafarnaldi*, *Vitrea excavata*, *Helix fusca*, *Clausilia rolfii*, or *Limnæa glutinosa* would be specially welcome.—WILFRED MARK WEBB, "Holmesdale," Brentwood.

PROCEEDINGS OF SOCIETIES.

The Malacological Society of London.

JANUARY 11th, 1895.—Ordinary Meeting.—Dr. H. Woodward, President, in the chair.

C. S. B. Cox and Mons. Pasquali were elected members of the Society.

The following communications were read:—(1) 'On a collection of land shells made by Mr. I. Kubary in German New Guinea,' by Dr. O. F. von Moellendorff; (2) 'Descriptions of three new species of *Engina* and a new species of *Defrancia*' by J. C. Melvill; (3) 'Notes on the anatomy of *Natalina trimeni*, Melv. and Pons.' by S. Pace.

FEBRUARY 8th, 1895.—Annual Meeting.—Dr. H. Woodward, President, in the chair.

The Report and Statement of Income and Expenditure were adopted; and the following were elected as the Officers of the Council for the year 1895:—President, Prof. G. B. HOWES, F.L.S., F.Z.S.; Vice-Presidents, W. H. HUDLESTON, F.R.S., Rev. R. BOOG WATSON, F.R.S.E., E. A. SMITH, F.Z.S., Dr. H. WOODWARD, F.R.S.; Treasurer, G. F. HARRIS, F.G.S.; Secretary, E. R. SYKES, F.Z.S.; Editor, B. B. WOODWARD, F.G.S.

Six other Members of Council:—G. C. CRICK, F.G.S., S. J. DA COSTA, Lt.-Col. H. H. GODWIN-AUSTEN, F.R.S., R. BULLEN NEWTON, F.G.S., J. C. MELVILL, F.L.S., G. B. SOWERBY, F.L.S.

After the Annual Meeting an ordinary Meeting was held, at which Charles Cooper and Peter Lawson were elected Members of the Society.

The following communications were read:—(1) 'On the genus *Clea*, by E. A. Smith; (2) 'The sinistral character of the shell of *Planorbis*,' by J. A. Vanstone.

(Vol. I., No. 5. of the Proceedings has just been published.—En.)

EDITORS' NOTES.

"The Zoological Record."—Zoologists have long deplored the fact that the parts of "The Zoological Record" are not sold separately. It may, therefore, interest some of our readers to know that Mr. S. Pace (Royal College of Science, London, S.W.) is dividing up the already bound (current and past) volumes, and issuing the separated parts to subscribers. Although it is, of course, not intended to make a profit out of the scheme, it will be necessary to charge slightly more for each part than its exact proportionate value, as some parts will, no doubt, remain unsold.

From the preface to Vol. VII. of "The Journal of Conchology," we learn that for the future it will cease to exist as an independent publication and that it will be continued as the organ of the Conchological Society of Great Britain and Ireland, under the editorship of Mr. W. E. Hoyle, M.A., of Manchester.

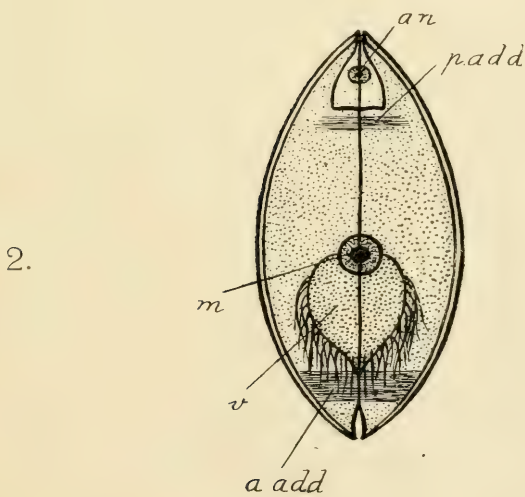
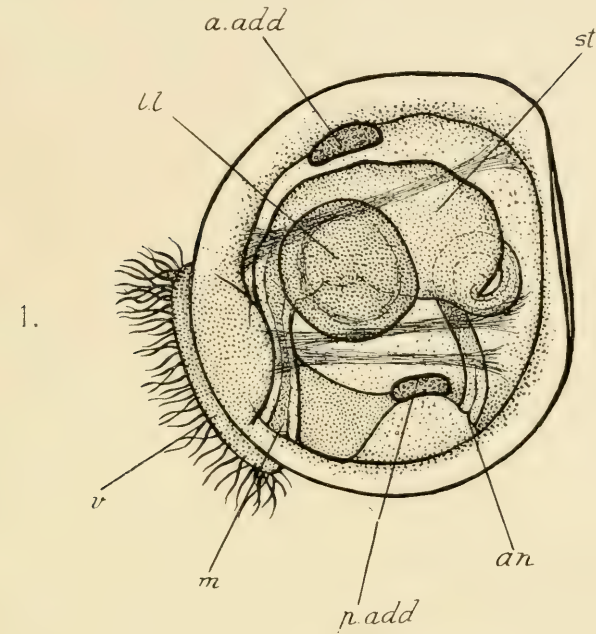
It is proposed to issue the title-page and index to Volume III. shortly.

Volume I. of "The Cambridge Natural History, Molluscs and Brachiopods" by Cooke, Shipley & Reed (Macmillan & Co.) has been received, but too late for review.

DESCRIPTION OF PLATE I.

FIGURE 1. An embryo of *Ostrea edulis*, L., seen from the left side in optical section. *a. add.* anterior adductor muscle ; *an.* anus ; *l.l.* left lobe of liver ; *m.* mouth ; *p. add.* posterior adductor muscle ; *s.* stomach ; *v.* velum.

FIGURE 2. The same, surface view from the ventral side. Lettering as in Figure 1.



EMBRYO OF *Ostrea edulis*, L.

THE JOURNAL OF MALACOLOGY.

No. 2.

JUNE 29th, 1895.

Vol. IV.

THE HABITS OF THE YOUNG SEPIA.

By FRANCIS A. BATHER, M.A., F.G.S.

British Museum (Natural History), London.

I send you a page and some sketches from my notebook at Roscoff last autumn. The notes may be of very small value, but I have seen no similar observations published.

For a day or two after its escape from the egg-capsule, the young *Sepia officinalis* attaches itself to the floor of the glass vivarium, or to other flat substances. The adhesion is effected by a definite area on the ventral surface of the body and of the postero-ventral arms, which area acts like a sucker, or in some ways like the foot of a gastropod. (Fig. 1.) The area has a distinct border not identical with the fins, but about one-third or half way between them and the median ventral line. The area is flat and colourless, except for a few pale yellow chromatophores such as are also found on the funnel and just within the pallial cavity. It is bordered by the ordinary chromatophores. The under surface of the fins is quite plain, but chromatophores extend for a little distance over their dorsal surface. This development of a ventral sucker is no doubt with the object of preventing the young cuttle-fish from being swept far away by currents, and is paralleled by the suckers in the young of many other animals, e.g., in tadpoles. The terminal disc in *Spirula*, if, as some have supposed, it is really a disc of attachment, may possibly have been derived from some such juvenile sucking habit. Pelseneer, however, denies this function to the terminal disc.

The young *Sepia* swims equally well in either direction by the thin transparent border of the mantle, which moves in sinuous waves with great rapidity. Only when considerably irritated does it shoot back by the expulsion of water from its funnel. One baby, when thus irritated, ejected ink twice within one minute of being taken from the egg-capsule. The ink, however, was not in the least enough to obscure its movements.

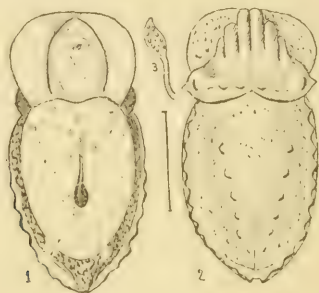


FIG. 1. Young *Sepia officinalis*. From below, attached to a glass plate, and drawn with the help of a mirror. The ink-sac is seen through the thin integument.

FIG. 2. From above while in the same position; the arms are retracted. The line between these two figures represents the actual length of the animal.

FIG. 3. One of the long arms, which are not seen in Fig. 2.

In early youth the chromatophores are not much used, or rather, one should say, the cells are usually kept contracted, so that the animal appears quite pale. Now and again a blush spreads over the back of the head between the eyes, and at the same time the antero-dorsal arms are stretched out. The effect is peculiar; one seems to *see* the animal thinking.

The two postero-ventral arms are very much larger than the others, perhaps three times as large. Next to them come the long arms, which partly lie in a small fold of the interbrachial membrane; they are the smallest pair. (Fig. 3). From them the arms increase in size, up to the antero-dorsal pair.

There are numerous tubercles on the body: six in a row down either side of the back, one under each eye, and a well-marked row on the ridge between the eyes. (Fig. 2.)

NEW BRITISH MARINE SHELLS.

By J. T. MARSHALL.

Scintilla eddystonia, n. sp.

Shell triangularly oval, a little broader than long, with an oblique outline, compressed, moderately solid for its size, semi-transparent, and glossy; sculpture, numerous but irregular concentric lines of growth; periostracum, none; colour, clear white except for irregular frosted patches, which are opaque; margins regularly rounded in front and at the sides, but with a more extended slope from the beak on the anterior side; beaks small but prominent, somewhat incurved, and nearer the posterior side; teeth, in the right valve, two strong and prominent cardinals, the posterior one being the larger, and a small lateral, on the posterior side; in the left valve, the same number and kind of cardinals, but not quite so large, with the position reversed, and the same lateral; inside highly polished; margins plain; muscular scars large and distinct. Length, 0·85; breadth, 0·1. Localities: Eddystone, Land's End, and Guernsey.



FIGURE 1. *Scintilla eddystonia*, n. sp. (enlarged). Eddystone.

I have been greatly puzzled where to place this species. I submitted it to Dr. Boog Watson and Mr. Edgar Smith without receiving any enlightenment. The Marquis de Monterosato, however, who has made the subject of Mediterranean mollusca his own, writes that it is "a species of a genus allied to *Scacchia*, near to *S. inversa*, Hil., and *S. pusilla*, Brug., but different and smaller." The two last-mentioned species are Monte Pellegrino fossils.

The frosted patches are, I believe, a characteristic of this peculiar genus, and cover about half the surface of the shell.

It is not the young of any British species, and its nearest representative among British shells is *Lepton clarkiae*; but this species is thinner, more oval and depressed, the beaks are less prominent and not so central, and the dentition is altogether different. Than the young of *Dipledonta trigonula*, which is also oblique and has somewhat similar teeth, the present species is thinner and more oblique, being broader than long. And in comparison with *Axinus cycladius*, this is more compressed, has strong and well-defined teeth, and is much less fragile.

I have named the species after the Eddystone Lighthouse, near which my specimens (five valves) were found about ten years ago. I have since then obtained another valve from the Land's End and one from Guernsey (20 fathoms), and I also have a pair of valves dredged by the Porcupine Expedition off Vigo Bay, in 20 fathoms, not noticed by Jeffreys in his report of that expedition.

It must be living in the vicinity of the Eddystone, as all the valves are quite fresh. They were procured in trawl refuse on ground composed mainly of the remains of polyzoa, known to the trawlers as "moss," and were associated with *Argiope cistellula*, *Cerithiopsis metaxac*, *Philine angulata*, and other rare species all new to this region, and I was doubtful at first whether the trawlers had not gone out considerably to sea, but am satisfied that the material came from the Eddystone grounds, the "moss" bottom being well known to trawlers.

The shells may possibly have previously been passed over for water-worn valves of *Astarte triangularis*, which swarms on the Eddystone grounds, and is not very unlike them outwardly, but is thicker, more simply triangular, and has a crenulated margin.

Lepton sykesii, Chaster.*

This species occurred to me in the summer of 1893, from dredgings obtained off the east coast of Guernsey, between the trawling grounds and St. Martin's Point, in 18 fathoms, with *Argiope decollata*. I had provisionally given it the MS. name of *Lepton pusillum*, and although my diagnosis does not quite agree with Mr. Chaster's, I have no doubt that my specimens belong to the same species.

* Annals and Mag. Nat. Hist., March, 1895, page 248.

It is like a minute *Pisidium*, and bears no resemblance to any British species except *L. sulcatulum*—in fact, Dr. Norman, who has seen the shells, pronounced them such. Like that species, it is circular in shape when viewed outwardly, but inwardly a slight though distinct angularity is observed at each corner, imparting a slightly squarish outline; it is glossy and semi-transparent, of a pale yellowish white, the concentric striae are finer and more close set, with stronger marks of growth, and these striae are visible inside the valves; the margins are equally rounded on all sides; the beaks are obtuse, they do not project beyond the outline of the shell, nor incline to either side; there is a comparatively conspicuous lateral tooth on each side of the beak in each valve; these are of the same size, and run parallel with the hinge-line, which is gently curved (I could not detect the “extremely minute cardinal” mentioned by Mr. Chaster); inside iridescent; margins plain; scars obscure. Length, 0.03; breadth, 0.03.



FIGURE 2. *Lepton sykesii*, Chaster (enlarged). Guernsey.

Than *Lasaea pumila*, S. Wood, this species is more convex, the striae are irregular lines of growth, the outline is somewhat oblique, and the dentition is different.

It is not, of course, the re-discovery of *Limopsis pellucidus*, Jeff., dredged by the author off Guernsey in 1858. That is a *Crenella*, of the size and shape of *Argiope capsula*, and has not since been met with in British waters. It is figured in Sowerby's Index.

L. sykesii comes under the genus *Neolepton* of Monterosato, but what other writers prefer to consider a sub-generic section of *Lepton*.

Although I have had many dredgings off the coasts of Guernsey, I have only met with this species once, and I had passed about a dozen valves in the examination of the material before my attention was attracted to it as differing from *L. sulcatulum*. But I secured a live specimen and half-a-dozen valves,

and as I have indicated the precise locality for it, no doubt more will be found hereafter.

***Odostomia oblongula*, n. sp.**

Shell forming a long oval, with an obtuse apex and produced base, thin, semi-transparent, glossy; sculpture, microscopic only, and consisting of longitudinal flexuous lines of growth; colour, clear white, opaque in dead specimens; spire very short; apex apparently truncated, the nucleus being obliquely depressed and intorted: whorls three only besides the nuclear ones, compressed but not flattened, the last occupying two-thirds of the shell viewed with the mouth downwards; the upper part of each whorl shows the usual thickened rim of the genus; suture shallow but clearly defined, and nearly straight; mouth pear-shaped, narrow and acute-angled above, slightly expanded below, its length being not quite half that of the shell; outer lip thin, not projecting beyond the periphery; inner lip not uniting with the outer, slightly reflected below and on the pillar, which is nearly straight; umbilicus none, but a slight groove runs behind the pillar; tooth very minute and retired. Length, 0.1; breadth, 0.04. Six specimens.

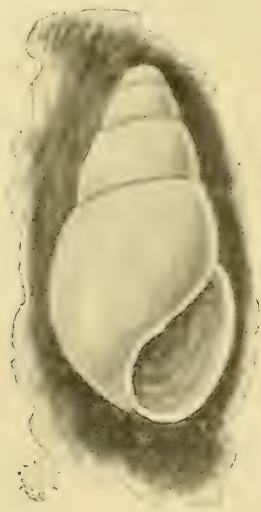


FIGURE 3. *Odostomia oblongula*, n. sp. (enlarged). The Minch.

Var. *ovata*, n. var.—Considerably expanded, egg-shaped, and umbilicate. Two specimens.

Habitat—The Minch, 72 fathoms, with *Eulima ephamilla*.

This species is characterised by a very short spire and long body-whorl. Its nearest British ally is *O. insculpta* var. *lucissima*, but in that shell the spire is longer and turreted, with a channelled suture, the aperture is oblong instead of pear-shaped, and there is a sinus at the upper corner of the outer lip. Its proper place is between *O. insculpta* and *O. diaphana*.

In comparison with *O. diaphana*, this is a stouter shell, with a distinct though slight tooth instead of an obscure fold, and the spire is not attenuated and spindle-like as in that species. From *O. obliqua* this species differs in being smaller, the suture is not so oblique, and the sculpture is absent. It is distinct from *O. tenuis*, Jeff., in being thinner, the spire shorter, the edge of the aperture does not describe a peristome, and the inside of the aperture is not grooved. From *O. nitens*, Jeff., it is marked off by being more oval, it has two whorls less, the apex is intorted, and it has a small tooth instead of an almost invisible fold: and finally, *O. nitens* is thicker, broader, and is not so glossy as *O. crystallina*, Monts. MS.

I had at first taken these shells for two species, and the Marquis de Monterosato did the same: in fact, he allocated the first to the *Lincolnia* group, represented by *O. clauda*, and the variety to the *Auriculina* group, represented by *O. obliqua*. But on full consideration I prefer to unite them, as intermediate specimens may yet be found to connect the two. At first sight they are very unlike, but I can detect no specific difference between them, except in the shape and in the presence of an umbilicus in the variety.

Macgillivray described an *O. oblonga*,* but that is our well-known *O. interstincta*, a very different shell.

Seasnoaks, Torquay,

May, 1895.

* as did A. Adams from the Japan Seas, Ed

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Cooke, The Rev. A. H.—Molluscs. Shipley, A. E.—Brachiopods (Recent).
Reed, F. R. C.—Brachiopods (Fossil). The Cambridge Natural History, vol. iii. (April, 1895) London, Macmillan & Co., 8 vo., 535 pp. (Price 17s. nett.) Mollusca pp. 1-459, 311 figures and 4 maps.

The writing of a book on a zoological subject, which shall be useful to "those who have not had a scientific training" † and at the same time to "serious students" † strikes one at the first as a task almost beyond the realms of realization, if not even, of expectation: for such an interest must be created, as to carry the novice merrily through those details that must otherwise seem dry to him, but in which, nevertheless, the old-hand intellectually revels. In order to bring about this state of affairs, the specialist must do what so many find to be an impossibility, and that is, to throw off that blind, unreasoning, not to say lamentable narrow-mindedness which is one outcome of specializing; he must feel, in spite of the opinions of his kind, that, after all, he is doing more real good to the cause which he has at heart, by gaining new adherents from a careless public and by taking his light from under the bushel of specialization, than by sitting still until some opportunity for feeding the flame of original research may come to him.

In volume iii. of the Cambridge Natural History, which deals with the Mollusca, and, to the credit of Malacology, is the first of the series to appear, the Reverend A. H. Cooke has come very near to attaining the ideal which he had before him, and, has succeeded in producing a book which cannot fail to bring new workers into the field, if only by the prominence given to

those features of the Mollusca which have always rendered the deeper study of this well-defined group so especially fascinating; while the experienced Malacologist can find here much that was hitherto scattered now brought together for the first time in a way that he will appreciate, and even the general biologist may gain from this work fresh illustrations of those general laws of existence to which his life is devoted.

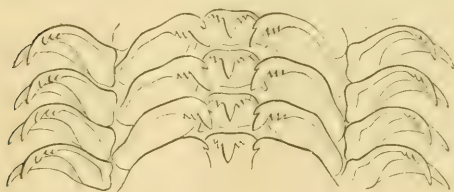


FIGURE 126. Four rows of teeth of *Vermetus grandis*, Gray, X 40.

Mr. Cooke in his opening chapters dilates upon the origin of land and fresh-water molluscs, together with the habits of these forms, and then, becoming more general he takes cognizance of the enemies of the group and the means of defence against them, including mimicry and protective colouration. Observations on this branch of

† See the prospectus of the Cambridge Natural History.

biology, with respect to the mollusca, are very sparse in the few books which deal with the subject, but many cases of protective colouring have been recorded, and although, in the work under consideration, space has been found for a number of these, one cannot help wishing for more. Figure 28, shewing a supposed case of true mimicry of a *Conus* by a *Strombus*, is reproduced. Parasitic molluscs, commensalism and variation have their fair share of attention and the facts presented under the last heading should act beneficially on the minds of those who still describe species from trivial shell-characters.

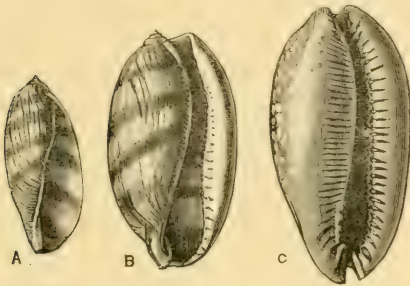


FIGURE 172. Three stages in the growth of *Cypraea exanthema*, L.

Passing on through the commercial aspects of the subject and the uses to which shells are put by civilized and uncivilized man, the mollusca are considered structurally and physiologically in an exceedingly thorough manner. Perhaps the chapter on digestive organs might be singled out for greater praise, seeing that it contains an exhaustive account of the radula; while on the other hand, in the chapter on the shell, although the adult form and the stages of its growth (see Figure 172)

are dealt with in great detail, comparatively little light is thrown upon its minute structure.

Geographical distribution is discussed in the three chapters which follow, and illustrations are given of characteristic mollusca from the various regions and their divisions (see Figure 210). Finally, the several molluscan classes are systematically considered as fully as is possible in the space which remains; the classification as stated in the preface being in accordance with the views of "leading recognized specialists."



FIGURE 210. *Cochlostyla* (*Chrysalis*) *mindoroensis*, Brod. Mindoro Philippines.

It is true that Pelseneer has been followed in so far as he puts the old class Pteropoda under the gasteropod order of Opisthobranchiata, but no further, the forms still being kept together as a sub-order. The Amphineura are included also under Gasteropoda, and are not considered to be worthy of the class-distinction accorded to them by Pelseneer.

In other instances un-notified, "discrepancies" will be found in which the specialists have been followed incompletely, or not at all.

It is, of course, easy for one who has taken an interest in some small points in Malacology to disagree with Mr. Cooke's treatment of those points, but the fact remains that the book, as a whole, deserves all praise, if only for two things—in the first place, it is not a monument to the weakness and laziness of authors, the short-sightedness and stinginess of publishers, or even to the extinction of draughtsmen and engravers, for the bulk of the illustrations are original; and in the second case the patriotic way in which, although the labours of workers outside the country are fully recognized,

those of Englishmen are systematically brought forward by the author of "Molluscs." Figure 20 is an instance of a copied drawing which does not represent what it is intended to show—to wit, the normally-extruded radula of a *Testacella* when feeding (see below p. 50).



FIGURE 20. *Testacella haliotidea*, Drap protruding (·) its pharynx (ph.) and radula (r); oc., oesophagus; p.o., pulmonary orifice; sh., shell; t., tentacles (after Lacaze-Duthiers).

In conclusion, although all of us cannot consider, with Mr. Brooke in George Eliot's "Middlemarch," whose words are quoted on the back of Mr. Cooke's title-page, that "conchology is a light study" now that empty shells are not its sum total, yet one must allow that many readers will not find this out until they have left far behind, not only the title-page, but very many chapters of this delightful book, the success of which it is a pleasure to contemplate.

W. M. W.

Kobelt, W. and H. Rolle.—"Iconographie der land und süß wasser mollusken." Neue folge, Supplemental vol. 1, pl. 32. Wiesbaden, 1895.

Martini and Chemnitz.—"Systematisches Conchylien Cabinet." Fortges. Von W. Kobelt, Lief., 412. Achatinidae, pp. 108-132, pls. 30-35.

Tryon, G. W., continued by Pilsbry, H. A.—"The Manual of Conchology," series 1, part 60 (contains vol. xv., pp. 181-436, pls. 43-50, 59-61); series 2, parts 33a and 36 (contain Vol. ix., pp. i-xlvi. and 161-366, frontis. and pls. 41-71). Published by the Acad. Nat. Sci., Philad. Feb., 1895.

The enormous undertaking in which Mr. Pilsbry is engaged, and for which the support of all naturalists is deservedly sought, may be gleaned from the fact that this quarterly issue contains over 500 pages and 40 plates. In the marine series, part 60 completes the study of the Tectibranchiata, and no student of these forms can complain that they have been neglected of late, when they have been surveyed by Mr. Pilsbry in the present work with especial reference to recent species, while Mons. Cossman has elsewhere reviewed them from a palaeontological standpoint, and Dr. Pelseneer has incidentally reviewed their anatomy. The usual number of generic names is changed as each new monographer appears to bring to light old uses of these terms which have escaped his predecessors. While we doubt if it were worth while to revive the old genus *Retusa*, Brown, for the species usually known as *Utriculus truncatulus*, we equally doubt if it be allowable to use *Volvula*, Adams, there being already, as Mr. Pilsbry admits, two prior genera named *Volvulus*, and a suitable name having been proposed by Mr. Newton. A similar remark may be made with reference to *Cylichna*, there being a prior *Cylichnus*. A new family Akeridae is created to contain *Akera*, *Haminea*, etc.

With the present parts of the terrestrial series, Mr. Pilsbry completes his great monograph on the Helicidae and Endodontidae. This, the most thorough study the group has ever had, has been worked out not in the shell alone nor in a single anatomical characteristic, but on the only basis which can ever be permanent, the general combination of anatomical and conchological characters. The Endodontidae stand as a family by themselves, while the Helicidae are divided into five great groups, characterised by variations

in the genital organs, jaw, radula and shell. The oldest known species is from the Carboniferous of Nova Scotia, and is probably a member of the genus *Pyramidula*: and Mr. Pilsbry points out in confirmation of the age of the Endodontidae that they have a wider geographic range than either the Helicidae or Zonitidae. The origin of, and reasons for the present generic distribution are carefully discussed, and Mr. Pilsbry concludes "that the western portion of Asia, together with Europe and North America, is peopled by a peculiar, highly-organised type of Helices practically confined to these regions, but evidently derived from extreme south-east Asia or the East Indies by a cretaceous (?) immigration."

The systematic portion of the work is done with great care, though we cannot help thinking that too many sections have been created in, or admitted into, such groups as, for example, *Eulota*. The disappearance of old and familiar names, too, is a source of regret, though doubtless strictly warranted and rendered necessary by the law of priority. Mr. Pilsbry admits five epochs in the study of the terrestrial mollusca, namely:—Linnean, Lamarckian, Ferussacian, Beckian, Albers-Martensian: there may now be added a sixth, the Pilsbryan. E. R. S.

Tryon, G. W., continued by Pilsbry, H. A.—"Manual of Conchology," 2nd series, Pulmonata, Index to the Helices, pp. 1-126. May, 1895.

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Babor, J. F.—"Doplňky k známostem o českých slimácích." Sitz. Gesel. d. wiss. Math. Nat., Prague, T. xviii-xviii., 1894, pp. 1-22.

Bergh, Dr.—"Beiträge zur kenntniss der Strombiden besonders der gattung *Terebellum*." Zool. Jahrb., vol. viii., pt. 3, 1895, pp. 342-378, pls. xxii. and xxiii.

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Chatin, A., and Muntz, A.—"Analyse des coquilles d'huîtres." C. R., vol. cxx., pp. 531-534.

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Garstang, W.—"On the gastropod *Colpodaspis pusilla* of Michael Sars." Proc. Zool. Soc., 1894, pp. 664-669, pl. xlv.

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The Pteropods are now recognised as being opisthobranch Gasteropods, but no mention is made of this fact, and the classification of the Mollusca is decidedly out of date.—W. M. W.

Kostal, J.—"Beitrag zur kenntniss des copulations-apparatus bei *Limacopsis coerulans*, Simroth (Bielz)." Sitz. Gesel. d. wiss. Math. Nat., Prague, 1894, T. xix.-xxii., pp. 1-15.

Pace, S.—"Notes on the anatomy of *Buliminus procteri*, G. B. Sow., and *Bulimulus kopelli*, G. B. Sow." Proc. Mal. Soc., vol. i., 1895, pp. 229-231, figs. 1-10.

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Schmidt, Ferdinand.—"Beiträge zur kenntniss der entwicklungsgeschichte der Stylommatophoren." Zool. Jahrb. Anat., vol. viii., pt. 3, 1895, pp. 318-341, 9 figs.

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- Perez, J.—"Sur le bulime tronqué." in "Notes Zoologiques." Act. Soc. Linn., Bordeaux (s. 5), vol. vii., 1895, pp. 314-315.

The disused apex of the shell in *Bulinus decollatus* is removed by a chance contact with a resisting object.

- Robson, J. E.—"On the irregular growth of the shell of the common limpet in confinement." Journ. of Marine Zool., vol. ii., No. 5, 1895, pp. 7-8.
- Simroth, Heinrich.—"Sur le développement de la coloration chez *Amalia gagates*." Ann. Sci. Nat., Porto, vol. ii., 1895, pp. 89-96.

The author points out that the colouration of young slugs represents an ancestral condition such as is seen in the lion-cub which is spotted. In *Limax maximus* the young ones of all the colour-forms—*cinereoniger*, *unicolor*, etc., etc.—are alike; very young individuals of the genus *Arion* belonging to the same species are of a colour peculiar to that species, but later on variations come in; in *Amalia* the young are usually like the parents, which vary geographically.

All the young of a black specimen of *Amalia gagates* were in the first place white with a semi-circular band of black on the mantle, one turned a reddish colour with a greenish tint on the sides, and of three others reared together, two became black, while the remaining one took upon itself a grayish tint with a suspicion of ochre.

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This continuation of the bivalves contains figures and descriptions of a number of new varieties. The exhaustive synonymy is strongly to be commended.

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- Lons-Hannover, H.—“Die mollusken-fauna Westfalens.” Jahresb. Westfal. Ver., vol. xxii., pp. 81-98. Bibl.
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SYSTEMATIC WORK.

Aldrich, T. H.—"Descriptions of two new Eocene Solariidae from Alabama." Naut., ix., 1895, pp. 1-2, pl.

A var. of *Solarium elaboratum* and *Solarium planiforme*.

Cockerell, T. D. A.—[See under "FAUNA":—*Veronicella* in Central America.]

Professor Cockerell points out how important it is, in describing new species of this somewhat difficult genus, to have "at least a dozen mature examples of each species," as "there is danger of taking varietal characteristics for specific ones." Notes are given on *V. olivacea*, Stearns, 1871; *V. moreletii*, Crosse & Fischer, 1872; *V. mexicana*, Pfr. and Strebel, 1873; *V. strebellii*, Semp., 1885 (?); and *V. decipiens*, Semp., 1885 (?). Two forms in the British Museum are described, but for the present left un-named; these are (1) *Veronicella*, sp. nov., vel. *mexicana*, var., Honduras; (2) *Veronicella*, sp. nov., vel. *punctatissima*, sub-sp., Panama. It seems that Heyneman has written "nov. sp.?" on the first. Judging from the descriptions of the above-mentioned specimens, we doubt very much their right to specific distinction.

W. E. C.

Cooper, J. G.—[See under "PALAEONTOLOGY":—Pliocene F. W. Fossils of California.]

Margaritana sub-angulata, n. sp.

Cooper, J. G.—[See under "FAUNA":—Mollusca of Lower California.]

Melaniella tastensis, n. sp.

Dall, W. H.—"An undescribed *Meretrix* from Florida." Naut., ix., 1895, pp. 10-11.

Meretrix simpsoni.

Dall, W. H.—"Contributions to the Tertiary Fauna of Florida: Part iii. A new classification of the Pelecypoda." Trans. Wagner Free Inst., 1895, vol. iii., pt. 3, pp. 485-570.

"In preparing the descriptive portion relating to different groups of the Pelecypoda, a point was reached when it became necessary to consider the general arrangement. As recent morphological and palaeontological studies have thrown a new light on the relations of the Pelecypoda, necessitating a revision of the earlier systems, and as a complete revision is nowhere accessible in print, it was thought that a statement of the characters chiefly relied on for classifying these animals, with comparable diagnoses of the several families in zoölogical order, would be useful for students of Palaeontology, and might form a proper introduction to the descriptive part of this memoir."

The above is Dr. Dall's own introduction to this most useful and valuable revision of the Pelecypoda of Florida, which, like all his writings, is characterised by a lucidity and thoroughness only too rare amongst students of the Mollusca. As our space does not permit of any lengthy review, it is sufficient to say that no student interested in either recent or fossil Mollusca, can afford to overlook so important a contribution, while those working at the Pelecypoda will welcome it as a most useful and valuable work.

A series of "Notes on Nomenclature" on pages 561-565 is well worth reading.

W. E. C.

Dall, W. H.—"New species of land shells from the Galapagos Islands." Naut., viii., 1895, pp. 126-127. No fig.

Bulimulus (Nacsiotus) reibischii and *Bulimulus (Nacsiotus) fanneri*.

Dall, W. H.—"New species of land shells from Puget Sound." Naut., viii., 1895, pp. 129-130.

New species:—*Patulastra* ? (*Punctum* ?) *pugetensis* and *Pyramidula* ? *randolphii*.

Dall, W. H.—"Synopsis of a review of the genera of Recent and Tertiary Mactridae and Mesodesmatidae." Proc. Mal. Soc., vol. i., 1895, pp. 203-213.

Frauscher, K.—"Nautilusse von Guttaring." Jahrb. Mus. Kärnten, vols. lxi. and lxii., 1895, pp. 185-207, 2 pls., 6 figs.

New species:—*N. tumescens* and *Aturia brunlechneri*. Description and figure of *N. seelandi*, Penneck.

Fulton, Hugh.—"Note on *Helix sauliae*, Pfr. (non Reeve) = *palumba*, Souverbie." Naut., viii., 1895, p. 125.

Jousseume, F.—"Diagnose des coquilles de nouveaux mollusques." Bull. Soc. Phil., Paris (s. 8), vol. vi., 1894, pp. 98-105. No figs.

In the description of new species, all rules of nomenclature are ruthlessly set aside; and there is nothing to shew which generic names are new. The new species are:—*Conus milne-edwardsi*, *C. phoebeus*, *Kyrina kyrina*, *Agagus agagus*, *Aspella gothica*, *Lampas bardeyi*, *Natica tadjourensis*, *Bulimus deflersi*, *Extra extra*, *Djeddilia djeddilia*, *Niotha voluptabilis*, *Rissoina savignyi*, *R. bouvieri*, *Plesiothyreus cosmani*, *Lepidopleurus rochebruni*, *Dentalium shoplandi*, *D. langieri*, *Stolida avalitensis*, *Scala malhaensis*, *Crisposcala bouryi*, *C. audouini*, *Hyaloscala amica*, *Nodiscala bouryi*, *Ancillaria djiboutina*, *Capulus pulcherrimus*, *Psammospaerita psammospaerita*, *Venus djiboutiensis*, *Macra crista*, *Metis coxa*. S. P.

Locard, A.—"Description de deux hyalinies nouvelles." Rev. Linn. xi., 1895, p. 4.

Hyalinia algarvensis and *Hyalinia gyrocurtopsis*.

Locard, A.—"Description de quelques Unionidae nouveaux pour la faune française." Bull. Soc. Elbeuf., vol. ii., 1893, pp. 49-62. No figs.

The so-called new species are:—*U. lanceolei*, *U. elboviensis*, *U. catinulus*, *U. levoiturieri*, and *U. lacrymiformis*.

Marshall, J. T.—"Alterations in 'British Conchology.'" J. of C., 1895, pp. 24-41.

Melvill, J. Cosmo.—"Descriptions of new species of *Pleurotoma*, *Mitra*, and *Latirus*." Proc. Mal. Soc., vol. i., 1895, pp. 221-223, pl. xiv., figs. 1-6 and 9-10.

Melvill, J. Cosmo.—"Descriptions of two new species of terrestrial Mollusca from the Hadramaut district, South Arabia." Proc. Mal. Soc., vol. i., 1895, pp. 224-225, pl. xiv., figs. 7 and 8.

Buliminus luntii and *Otopoma bentianum*.

Melvill, J. Cosmo.—"Descriptions of four new species of *Engina* and a new species of *Defrancia*." Proc. Mal. Soc., vol. i., 1895, pp. 226-228, figs. 11-15.

Mollendorf, O. F. von.—"On a collection of land-shells made by Mr. J. Kuby in German New Guinea." Proc. Mal. Soc., vol. i., 1895, pp. 234-240, pl. xv.

New species:—*Planispira (Cristigibba) papuana*, *Satsuma euconus*, *S. dasypleuris*, *Papuina kubaryi*, *P. planogyra*, *Buliminus (Ena) colonus*, *Cyclophorus kubaryi*, *Cyclotus (Pseudocyclophorus) canaliculatus*, *Adelomorpha laeta*, and *Helicina (Sulfurina) sphaeroconus*.

Parona, C. F.—"I Gasteropodi del Lias inferiore di saltrio in Lombardia." Boll. Soc. Mal. Ital., xxviii., 1895, pp. 161-181, 2 pls.

Pleurotomaria new forms. A new species of *Ataphrus* and of *Chemnitzia*.

Pilsbry, H. A.—[See under "FAUNA":—Tasmanian *Ischnochiton*]

New species:—*Ischnochiton (Haploplax) mayi*.

Quadras, J. F., and Moellendorff, O. F.—"Diagnoses specierum novarum ex insulis Philippines." Nachr. Mal. Ges., 1895, pp. 73-88.

New species:—*Ennea* (*Diaphora*) *cylindrica*, *Vitrinidea quadrasii*, *Helicarion papillifer*, *Hemitrichia velutinella*, *Bensonina* (*Glyptobensonina*) *diplotropis*, *Aulacospira triptycha*—*Cylindrotis*, a new genus of the Auriculidae—*Cylindrotis quadrasii*, *Stenothyra decollata*, *Assimineia quadrasii*, *Ditropis pusilla*, *Cyclophorus aitarum*, *C. coronensis*, *Lagochilus tumidulum*, *L. curyomphalum*, *L. cagayanum*, *L. scalare*, *L. polytropis*, *Leptopoma poecilum*, *Cyclotus anthopoma*, *C. anocampius*, *Porocallia canalifera*, *Alycaeus quadrasii*, *Helico morphia globulus*, *Arinia calathiscus*, *A. contracta*, *Palaina catanduanica*, *P. deformis*, *Diplommantina masbatica*, *D. goniocampita*, *D. elegantissima*, *D. mindanavica*, *D. diplosloma*, *P. cyrtochilus*, *Diarctia* ? *philippinica*, and *Georissa coccinea*.

Rolle, H.—"Eine neue *Achatina*." Nachr. Mal. Ges., 1895, pp. 100-101.

Achatina usambarensis.

Simpson, C. T.—"On the validity of the genus *Margaritana*." Amer. Nat., vol. xxix., 1895, pp. 336-344.

" *Margaritana* is not a valid genus the name merely stands for certain groups, or parts of groups, of Unios of polyphyletic origin. . . . all the species will have to be relegated to the genus *Unio*."

Simpson, C. T.—"*Unio ochraceus* and *cariosus*." Naut., viii., 1895, pp. 121-123, 2 figs.

Smith, Edgar A.—"Description of a new species of *Helix* from Burmah." Proc. Mal. Soc., vol. i., 1895, pp. 219-220. Fig.

Helix (*Plectotropis*) *armstrongi*.

Sowerby, G. B.—"Descriptions of nine new species of shells." Proc. Mal. Soc., vol. i., 1895, pp. 214-217, pl. xiii.

Bulimus corticosus, *Bulimulus buckleyi*, *B. procteri*, *Conus coxianus*, *C. elegans*, *Pisania bednalli*, *Murex multiplicatus*, *Pecten townsendi*, and *Succinea kurachensis*.

Sykes, E. R.—"On a new helicoid land-shell from New Zealand." Proc. Mal. Soc., vol. i., 1895, p. 218.

Endodonta (*Charopa*) *prestoni*.

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Aldrich, T. H.—[See under "SYSTEMATIC WORK":—Eocene Solariidae.]

Bonarelli, G.—"Fossili domeriani della Brianza." Rend. Inst. Lombardo (ser. 2), vol. xxviii., 1895, pp. 326-

Cooper, J. G.—"On some Pliocene fresh-water fossils of California." Proc. Calif. Ac. (ser. 2), vol. iv., 1894, pp. 166-172, pl. xiv.

Dall, W. H.—[See under "SYSTEMATIC WORK":—Tertiary fauna of Florida.]

Frauscher, K.—[See under "SYSTEMATIC WORK":—Nautilusse von Guttaring.]

Kennard, A. S.—"Pleistocene Mollusca of Crayford." Sci. Goss. (new ser.), vol. ii., pp. 39-40. Figs.

Lioy, P.—"Sui resti organici trovati in alcune grotte del Vicentino." Atti. Inst. Veneto (ser. 7), vol. vi., pp. 312-317.

Paronà, C. F.—[See under "SYSTEMATIC WORK":—Gastropods from the Lias of Lombardy.]

- Simonelli, V.—"Fossili terziari e post-pliocenici dell' Isolo di Cipro raccolti dal Dott. A. Bergeat." Mem. Acc. Bologna (ser. 5), vol. iii., pp. 153-152.
- Vaughan, T. W.—"The stratigraphy of north-western Louisiana." Amer. Geol., vol. xv., pp. 205-229.
Gives lists of the contained fossils.
- Weller, S.—"The succession of fossil faunas at Springfield, Missouri." Am. Journ. Sci. (s. 3), vol. xlix., pp. 185-199.

COLLECTING AND CULTURE.

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A short account of the *Turbinella* fishing industry.
- Collier, Edward.—"Notes on a Conchological Excursion to the West of Ireland." J. of C., viii., 1895, pp. 42-46.
- H———, W. A.—"Mussel-culture." Nature, vol. li., 1895, pp. 578-579.
A review of Calderwood. See J. of Mal., vol. iv., pp. 28-29.
- Haynes, T. H.—[See under "BIOLOGY":—Pearl growth.]
States that one diver was able to predict the shells that would contain pearls, from the two sides of the hinge in these shells not being parallel.
- Oliveira, P. de.—"Préparation et conservation de quelques animaux par l'aldéhyde formique." Ann. Sci. Nat. Porto., vol. ii., 1895, pp. 69-76.
Four parts of "normal solution"—40 %—to 100 parts of water, is the solution recommended.
- Walker, Bryant.—"A month with the Michigan Fish Commission." Naut., ix., 1895, pp. 2 and 3.
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NOTES.

Habits of the Agnatha.*—Under this heading, Mr. Cooke, in the third volume of the "Cambridge Natural History,"† briefly describes the way in which he would lead one to suppose that *Testacella* catches and swallows its prey. The account is professedly based upon a sixteen-line note by Mr. Butterrell,‡ and is intended to be made clearer by a drawing of



Testacella scutulium, Sowerby.—1. Seen from above.—2. From the right side.—3. Contracted and with the radula protruded.—3a. The radula from above, enlarged.—4. As 3, but the radula has an earth-worm in its grip.—4a. Radula seen from the right side, enlarged.—5. Enveloping the worm.—6, 6a and 6b. "Teeth" from the radula, isolated and enlarged.

Testacella haliotidea taken from a figure by Lacaze-Duthiers.§ The fact related by Mr. Butterrell, that a gentle touch on the head with a pencil caused his specimen of *Testacella maugei* to protrude its radula, is not repeated by Mr.

* A. H. Cooke—*The Cambridge Natural History*, vol. iii., 1895, pp. 51-55.

† See above, p. 42.

‡ J. D. Butterrell—"Note on *Testacella maugei*, Fér." *Journ. of Conch.*, vol. iii., p. 277.

§ H. de Lacaze-Duthiers—"Histoire de la Testacelle," *Arch. Zool. Expér.* (ser. 2), vol. v., 1887, p. 459.

Cooke; but it is important in connection with the animal's habits, which have been made the subject of much fanciful exaggeration, as it points to the more or less automatic capture of the prey, the details of which are worked out in a paper by the present writer.* (Reference given by Mr. Cooke.)

It is, of course, very difficult to reproduce, in the open, conditions which are to be met with underground, but it seems fairly certain, from the various observations made during the last 150 years, that *Testacella*, as a rule, seizes the earth-worm by the anterior end (Figs. 4 and 4a), a fact which might also be surmised from the slug's habit of taking up its position in the burrows of its prey. Only in special cases, therefore, is another part of the victim's body impaled, as apparently happened in Mr. Butterell's somewhat artificial experiment where he held the worm, and in which the head of the latter "was rejected." Again, in life, apparently, the odontophore cannot be extruded unless the animal be itself contracted (Fig. 3), and swallowing is not so much effected by the withdrawal of the radula after the prey is transfixed by the barbed teeth with which it is beset (Figs. 4a and 6), as by the re-extension of the slug, which literally "puts itself outside" of its struggling repast (Fig. 5).



FIGURE 20. *Testacella haliotidea*, Drap protruding (?) its pharynx (ph.) and radula (r); oe., oesophagus; p.o., pulmonary orifice; sh., shell; t., tentacles (after Lacaze-Duthiers).

With respect to the figure after Lacaze-Duthiers—the original one represents a specimen which is by no means normal, being probably taken from a drowned example, or one that was at least "sick unto death;" it is, moreover, described by Lacaze-Duthiers as one shewing the buccal mass "evaginé," which cannot here be rightly construed into "protruding its pharynx and radula." In fact, Fig. 20, as it stands in the Cambridge Natural History, is calculated to give a very false impression as to the whereabouts of the oesophagus when the animal is feeding, in connection with which organ the only reference to the figure is made.

A reduced facsimile of the original drawings from nature illustrating the writer's paper already alluded to is reprinted from an abstract of the same in the "*Essex Naturalist*,"† through the kindness of the Editor of that publication.

WILFRED MARK WEBB.

On the specific identity of *Papuina hedleyi*, Smith, and *P. canefriana* (Dohrn. MSS.), Kobelt.—At the suggestion of Mr. Hedley, I have examined the type of Mr. Smith's species and compared it with the figure and description given by Dr. Kobelt (*Conch. Cab.*, *Helix*, Lief. 410, 1894, p. 708, pl. 202, figs. 1 and 2), and can only come to the conclusion that they are slightly varying forms of the same species.

E. R. SYKES.

The Larval Oyster.—At a recent meeting of the Malacological Society, Mr. Martin F. Woodward read a note on the larval oyster, in which he gave it as his opinion that the structure alluded to as a probable posterior adductor in the last number of this Journal has an epiblastic origin, and represents the beginning of the visceral nerve ganglion.

* Wilfred Mark Webb—"On the manner of feeding in *Testacella scutulum*," *Zool.*, vol. xvii., 1893, pp. 281-289, Pl. I.

† *Testacella scutulum*, Sowerby. *Essex Nat.*, vol. vii., 1893, pp. 120-123.

Variations in Radulae.—It would be interesting to know what variations have been observed in the radulae of mollusca, for in some of the common species considerable modifications of the formula recognised as

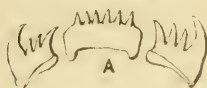


FIGURE A. Row of teeth from radula of *Buccinum undatum* (Rhachiglossate-type—formula 1-1-1).

typical have been noted. The normal radula in *Buccinum undatum* appears to have 100 rows of teeth, each row consisting of a median tooth or plate with six pointed cusps between two laterals, each forming a set of four slightly-hooked cusps, as represented in Fig. A. Recently I have observed two variations in specimens I have mounted for the microscope. In one case there are six median spikes (one being bifurcated), with four on the laterals of one side and five on that of the other, as seen in Fig. B. In the other example there are six lateral (one being bifurcated) on one side and four on the other, as in Fig. C. The mollusca from which these radulae were dissected were obtained in the

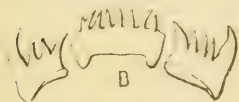


FIGURE B. *Buccinum undatum*. Row of teeth with a bifurcated cusp to the middle plate.

Central Fish Market, London, so that I cannot indicate the locality from which they were dredged.

Mr Wilfred Mark Webb has, however, within the last few days, sent me an account of 22 radulae of *B. undatum* taken at random from Brightlingsea, and which show very great variation. Only eight of these are normal. One example has four median cusps between two sets of four lateral ones. Five specimens have five median between two sets of four lateral projections, and of these two examples have the second lateral cusp from the outside on the left hand small and adnate to the third lateral from the outside. Two specimens have six points to the median between four on the left hand lateral and three on the right. Four specimens have a median tooth showing seven points, while the lateral teeth are normal. One specimen resembles the last, but has an extra cusp to the median tooth; and lastly, one has the cusps on the median tooth increased to eight, while those of the lateral plates are reduced to three.

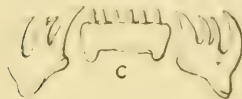


FIGURE C. *Buccinum undatum*. Row of teeth from radula. The right lateral plate has three complete cusps, one being bifurcated.

GEORGE BAILEY, F.R.M.S.

EDITORS' NOTES.

We thank "THE JOURNAL OF CONCHOLOGY" for its kindly notice of our previous Number, and express the hope that its new Editor and Committee of Publication may attain to that success which it so generously wishes us.

Corrigendum.—In Figure 1 on Plate I., the coil of the intestine should be on the left side of the stomach, that is, in front of, and not behind the latter, as there depicted.

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Vol. IV.

MOLLUSCA OF THE ORIENTAL REGION,

By CHARLES HEDLEY, F.L.S.

Australian Museum, Sydney, N.S.W.

As might have been anticipated from the tastes and previous writings of the author, one of the chief excellencies of Mr. A. H. Cooke's admirable work on "Molluscs," is the section dealing with Geographical Distribution. Though the subject is investigated independently of the classic scheme of Wallace, yet the conclusions of that great authority are generally taught by Cooke.

Wallace's limitations* of the Oriental Region seemed to me, when inquiring into that fauna, to rest upon less clear distinctions than those defining the Palaearctic, the Ethiopian or other main divisions. I prefer the first conception † he entertained on his return from the East, of a province "extending from the Nicobars on the north-west, to San Christoval, one of the Solomon Islands on the south-east, and from Luzon on the north, to Rotti, at the south-west angle of Timor, on the south." Fischer once wrote, ‡ "A study of the terrestrial molluscs, shows but little difference between the faunas of Bali and of Lombok, and only these particular features (certain birds) induces an appreciation of the importance of the line of demarcation drawn by Wallace." That Cooke, sharing Fischer's estimate of "Wallace's line," should, while retaining Wallace's provinces, shift his boundaries to a position past the Molluccas, is further proof of their indefiniteness.

Only they to whom species are real entities, not mere names written on slips of paper, can hope to solve these problems. It is upon the experience of actual travel, collecting and study in Australia and New Guinea that I base my opposition to Mr. Cooke's views, and my contention that, on the one hand, Papua

*Geographical Distribution of Animals, vol. i, chap. xii.

†Report British Assoc., 1863, Trans. p. 107.

‡Compte-Rendu des Séances du Congrès international de Zoologie, Paris, 1889, p. 28.

is as integral a part of the Oriental Region as any of its recognised sub-regions; and that, on the other hand, as great a difference parts the Australian, from the Papuan sub-region as intervenes between any two regions. The Papuan tract agrees with the Oriental, in its characteristic wealth of operculates and *Naninidae*, and disagrees with the Australian, in the presence of these two and in the comparative absence of the *Rhytididae*, the *Endodontidae* and the *Acavinae*.

I wrote in 1891 * “Wallace’s line, so conspicuous a severance among the vertebrates, appears to be quite blotted out when the distribution of animals is regarded from a molluscan standpoint. No sharp break occurs between the Malayan fauna as exemplified in Borneo or the Philippines and in New Guinea. All the characteristic Malayan forms, *Atopos*, *Xesta*, *Helicarion*, *Microcystina*, *Trochomorpha*, *Obba*, *Chloritis*, *Cochlostyla*, *Pupina* and *Diplommantina*, are common to both regions. The Solomon Islands, Fiji, &c., appear by the light of the Papuan shells to be inhabited by an eastern extension of this Malayan fauna, which has also overflowed into Queensland.” Wider knowledge has since strengthened my belief in the correctness of this estimate, and recently I have been gratified to receive support † from so high an authority, and one so well acquainted with the Malayan fauna, as Dr. von Moellendorff.

Botanists confirm the homogeneity of the province as thus expressed, for Hemsley writes, ‡ “There is no doubt that the combined Fijian, Samoan and Tongan flora is eminently Malayan in character.” For the correspondence between the Bornean and the Papuan floras see Dr. O. Stapf’s paper. §

Mr. Cooke’s summing || of the Papuan fauna much exaggerates its Australian tinge. We read that *Rhytida* “emphasises this union still further.” But *Rhytida* is Alpine in New Guinea and only “unites” these two countries as an Alpine Gentian might “unite” Italy with Iceland. The *Pedinogyra* would indeed be—if it were not mythical—a strong link. That *Perrieria* inhabits both Queensland and New Guinea is hardly to the point, since, as Mr. Cooke admits, it has migrated southwards from the one to the other. Of the characteristic Australian genus *Hadra*, Mr. Cooke quotes (presumably from my article) four Papuan species. After dissection and closer

* P.L.S.N.S.W. (2), vi., p. 693.

† Pro. Malac. Soc., I., p. 234.

‡ Journ. Linn. Soc., Botany, xxx., p. 211.

§ Trans. Linn. Soc., 2nd Ser., Botany, vol. iv., pt. 2.

|| Of “Molluscs,” Cambridge Natural History, vol. iii.

examination I now eliminate all of these but *broadbenti* from *Hadra*.

Conversely: the affinities of New Guinea with western lands is unduly depreciated. The decisive testimony of a whole group of *Cochlostyla* is suppressed, *Obbina*, *Vaginulus* and especially *Rhysota*, all related westward, are more numerous than here indicated. While Mr. Cooke wrote, "Not a single *Cyclophorus* occurs," Dr. von Moellendorff's report of its occurrence was receiving publication. "*Lagochilus* so marked a feature of the Indo-Malayan fauna," instead of being as Mr. Cooke unfortunately declares, "conspicuous by its absence," had already been reported by Dr. von Moellendorff from Papua.

Upon the hypothesis that the Queensland fauna is the oldest Australian constituent, Wallace derives * the New Zealand fauna therefrom. But upon the opposite premises that the Queensland fauna is the latest arrival in Australia, I deduce † that the New Zealand fauna sprang not from Australian, but from Melanesian sources. Having adopted ‡ my conclusions on the origin of the Queensland snail-fauna, Mr. Cooke cannot with compatibility accept also the results of Wallace's irreconcilable proposition § that the relations of New Zealand are with N.E. Australia. I may be excused for here repeating my statement, that the supposed molluscan community of New Zealand with Northern Australia rested upon the fictitious existence in New Zealand of *Paryphanta millegani*, *Hadra reinga*, *Cristigibba taranaki* and *Rhytida rapida*, and on the equally fictitious presence in Australia of *Charopa kivi*, *C. ophelia*, *C. siczac* and *C. coma*.

It has been shown by the writer and accepted by Messrs. Cockerell and Collinge that the *Fanellidae* properly embraces both *Fanella* and *Hyalimax*. These ancient wrecks of past epochs, tempt speculation, as to whether the Oriental Region of to-day may not have been evolved from an equatorial tract whose crescent swept from New Zealand to Mauritius.

Summary: My conclusion briefly is that, as far as the mollusca are concerned, the Oriental Region should be extended to include the Papuan, Polynesian and Melanesian Sub-regions, the latter to contain New Zealand; while the Australasian should be restricted to Tasmania and Australia minus Queensland.

* Island Life, 2nd Ed., Chap. xxii.

† Natural Science, vol. iii, pp. 187-191.

‡ p. 322; § p. 325 of vol. iii., Cambridge Natural History.

|| Conchologist II., p. 195.

NOTES ON A FEW OF THE LESS-KNOWN BRITISH MARINE MOLLUSCA.

By GEORGE W. CHASTER, M.R.C.S.,
Southport.

Adeorbis imperspicuus, Monterosato,
1875, *Nuova Rivista*, p. 36 (name only).

IN the "Conchologist" for June 24th, 1893, I announced the discovery in British waters of this shell which had been identified by the Rev. Canon Norman as *Cyclostrema millefunctatum*, Friele. Subsequently, when I had an opportunity of examining the description and figures of that species, grave doubts arose in my mind as to the correctness of the naming of my shells. These were submitted to Herr Friele who declared that they were not his species, of which he courteously sent a specimen for examination: it is much larger, shaped like *Helix pulchella*, and has the sculpture coarser and less regularly arranged in spiral rows.

The Marquis of Monterosato, however, at once recognized my shells as his *Adeorbis imperspicuus* and kindly sent me a type specimen labelled thus: "*Tornus imperspicuus* Monts=*T. subcarinatus*, Mtg. *pullus*? (*Adeorbis*) Palermo 80-100 fh."

The species has, so far as I can ascertain, never been described, except in the "Journal of Conchology" for Jan., 1894, when a short description was given of one of our Oban specimens (Chaster and Heathcote: *Moll. of Oban*, *loc. cit.*). This, however, partly refers to a varietal modification, and I, therefore, venture to figure and describe the type. No figure has been published before.

The Marquis of Monterosato is apparently in doubt as to whether his species is the fry of *Adeorbis subcarinatus*, Mtg., or not. When, however, a young shell of the latter, of the same size, is placed beside the former, the two are wholly unlike, evidently having no characters in common, as will be seen by comparing the rough sketch given in Fig. 2, with Fig. 1.

Adeorbis imperspicuus, Monts. Figs. 1, 1a. *Shell very thin, spire scarcely raised; whorls about two, flattened and sloping at the*

sides, rounded at the periphery, and markedly but bluntly angulated below, sculptured with numerous spiral rows of very minute pits or punctures which, except at the periphery, are obscured by closely-set, flexuous, oblique, raised striae in the direction of the lines of growth; suture channelled; mouth squarish; outer lip thin, flexuous, sinuated above; umbilicus very large, occupying all the under surface.—Height, 0.6 mm.; breadth, 0.8 mm.

FIGURE 1.



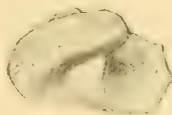
FIGURE 1A.

*Adeorbis imperforatus*, Monts.

FIGURE 2.



FIGURE 2A.

*Adeorbis subcarinatus*, Montg.

Varietas ex formâ, var. elegantula, nov. In many specimens the exaggerated lines of growth which in the type constitute a true sculpture are almost absent, the shell being hyaline and nearly smooth save for the characteristic punctation. In my limited experience, such shells are of smaller size and may be designated as above.

Distribution. I have met with the type in dredgings from Oban and Roundstone. Marshall records it from off Southport, and Monterosato from Palermo and Messina.

The variety I have from Oban, Isle of Man, and Tangier Bay (7 fathoms). As regards the retention of the name *Adeorbis*, I follow Fischer and others, although the first species that S. Wood gave in his newly-created genus, *Adeorbis* was the shell now commonly known as *Circulus striatus*, Phil. which Monterosato therefore styles *Adeorbis striatus*, Ph. This is a matter upon which I am entirely unable to decide, and one upon which I should be glad to be informed authoritatively.

Lepton sykesii, Chaster.

Ann. and Mag. Nat. Hist., Mar., 1895, p. 248.

Mr. Marshall is quite correct in his supposition that it is my species that he described and figured in the "Journal of Malacology" of June last. His figures represent the outline and general appearance of the shell remarkably well, although the sculpture is not shown, the concentric markings seen in the sketch of the exterior not even suggesting the character of the sharply defined and regularly placed lines seen on the shell. Respecting the structure of this hinge I was able to satisfy myself as to its true nature, only by examining it in a live specimen the valves of which had been separated and deprived of the cartilage by careful boiling in dilute caustic soda solution. It is true that the minute cardinal I described is not very readily detected when the valve is examined in the usual flat position. If, however, this be placed almost vertically with the dorsal area uppermost it is quite apparent, and valves, even in the more or less worn state usual with dead shells from Guernsey dredgings, generally exhibit some trace of it.

The species is not, in my opinion, a member of the "*Ncolepton*" group as Mr. Marshall declares. *Neolepton* is described by its founder Monterosato, in his "Nomenclatura," as follows:—"Genere proposto per le specie oblique che hanno una scultura concentrica ed il cardine di altra struttura." Now *L. sykesii* agrees with *Lepton* proper in its sub-rhomboidal outline and in its hinge, the latter, it is almost needless to say, being the most important character for purposes of classification. The hinge teeth are quite similar to those of *L. nitidum*, Turt., even in their position, the cardinal in the right valve being placed midway between the laterals, whilst that in the left valve is close to the posterior lateral.

This species is by no means restricted to the Channel Islands for I have it from other localities, having met with it in material from Mounts Bay, Cornwall, dredged by Mr. G. F. Tregelles, as well as in my own recent dredgings there. I also found a valve in shore-drift from Dogs' Bay, Connemara, collected this summer by Mr. R. Standen.

Crenella pellucida, Jeff., sp.

1859, *Limopsis pellucida*, Jeff., Ann. and Mag. Nat. Hist., p. 12, pl. 11, fig. 6.

Mr. Marshall's reference (*loc. cit.*) to this species seems wholly irrelevant, and is, moreover, unfortunate in containing

an assertion that this species has not been found in British waters since its discovery by Jeffreys. I have myself met with it in Guernsey dredgings. Still more unfortunate, however, was Jeffreys' statement in his "British Conchology" that it is the fry of *C. rhombea*, Berk. As the Annals and Magazine of Natural History for 1859 may not be readily accessible to many conchologists I have given below a figure of this species and an outline of the true fry of *C. rhombea* for comparison.

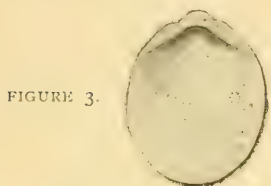


FIGURE 3.

Crenella pellicida, Jeff. $\times 30$.



FIGURE 4

Crenella rhombea, Berk. $\times 30$.

Cerithiopsis clarkii, Forbes and Hanley.

1848-53, *C. clarkii*, F. & H., Brit. Moll.; vol. iii., p. 368, pl. ciii., fig. 6.

As a representative of this form I have but a dead specimen not in very good condition from Guernsey dredgings sent by Mr. E. R. Sykes.

Jeffreys in his "British Conchology" dismisses it with a scanty description as a monstrosity of *C. tubercularis*, Montg., obtained by Mr. Clark, at Exmouth, and by himself at Guernsey. In his "Lighting" and "Porcupine" papers he similarly disposes of it and gives as synonyms *C. bilineata* and *C. coppolæ*. The Rev. R. Boog Watson, in his excellent "Cerithiopsides from the eastern side of the North Atlantic," * also confounds it with the Mediterranean shell. Now *C. coppolæ*, Arad. (= *bilineata*, Brus., non Hörnes) is certainly quite distinct from *C. tubercularis*, its apex as well as its sculpture and shape, being very different. My Guernsey shell Monterosato designates "le vrai *C. Clarkii*, F. & H.," and declares to be distinct from *C. coppolæ*, an opinion with which I entirely agree. The figure in "British Mollusca" well represents it. I am anxious to learn whether others who have specially studied the molluscan fauna of the Channel Islands can give further information regarding this interesting species and whether or not it is to be considered extinct.

N.B.—In figure 1a the whorls are insufficiently flattened and sloping, and in figure 4 the shell is too equilateral and the umbo too acute.

* Journ. Lin. Soc., 1885, Zoölogy, vol. xix., p. 92.

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Martini and Chemnitz. Systematisches Conchylien Cabinet. Fortges. von W. Kobelt. Nürnberg, 1895, part 414, pp. 49-54, pls. zvi-xxi. (finishes Mollusca Dimyaria—Gastrochaenidae), parts 413 and 415, pp. 751-794, pls. cvii-cxiii. (*Helix*).

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Tryon, G. W., continued by Pilsbry, H. A.—"Manual of Conchology," series 1, part 61 (contains vol. xvi., pp. 1-48, pls. i-xvi.); series 2, part 37 (contains vol. x. pp. 1-48, pls. ii-xv.), Philadelphia, Sept., 1895.

In the Marine Series, part 61 is almost entirely filled with an account of the *Philinidae*, which Mr. Pilsbry states may be divided into three, or possibly four, genera; these last being founded on combinations of the shell and external bodily characters.

An exceedingly interesting review of the history of the names *Bulinus* and *Bulinus* commences the new volume of the Terrestrial series. The conclusions arrived at are that *Bulinus*, Adanson (1757) should be ignored; that *Bulinus*, Scopoli (1777 non 1786), represents a freshwater shell, preferably *Bythinia* (which name must be abandoned); that *Strophocheilus*, Spix (1827), should, therefore, be used for the group usually known as the *Bulimi*. It is with regret that we have to concur in this lamentable conclusion. In the letterpress referring to *Borus oblongus*, Müller, Mr. Pilsbry appears to have overlooked a recent study of the species by Mr. E. A. Smith (Proc. Mal. Soc. i., 1894, p. 137). A reference to this paper would have saved his naming from Tobago, a variety already described by Mr. Smith from that island.

Borus oosomus, from Brazil, is a new species belonging to the group of *B. ovatus*, to which it appears nearly allied.

An introduction and key to the groups are promised latter; we trust that the author will be as successful as when dealing with the *Helicidae*.

E. R. S.

ANATOMY.

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Note on papers by Mr. Willey, see p. 49; and Dr. A. Vayssière, see below, p. 61.

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Gwatkin, H. M. and Suter, Henry, with a prefatory note by Pilsbry, H. A.—"Observations on the dentition of the Achatinellidae." Proc. Ac. Phil., 1895, pp. 237-240.

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New species:—*Murex tatei*, *M. robustus*; *Trophon angustus*; *Latirus aurantiacus*; *L. pulleinei*; *Crassatella producta*, *C. micra*.

VARIATION.

- J. C. W. and P. H. A.**—"A remarkable monstrosity of *Fulgur canaliculatum*." *Naut.*, vol. ix., 1895, pp. 25-27.
- Sich, Alfred.**—"Helix rotundata, Mull. (*sinistrorsum*, Taylor)." *Zoöl.*, vol. xxx., 1895, p. 380. In a garden at Chiswick.

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- Elles, G. L., and Wood, E. R. M.**—"On the Drygill Sandstones." *Geol. Mag.*, vol. ii. (N.S.), 1895, pp. 246-9.
- Etheridge, R., jnr.**—"Additional notes on the Palaeontology of Queensland." *P.L.S., N.S.W.*, 2, ix, pp. 518-539, pls. xxxix.-xli.
Cypricardella rectangularis, *Edmondia smithii*, *Ptychomphalina randii*, new spp., fig., unnamed spp. of *Bellerophon*, *Loxonema* and *Productus*, figured, *Athyris roysii*, *Leveille* and *Chaenomya etheridgei*, Kominch, re-figured. All Palaeozoic.
- Foresti, L.**—"Enumerazione dei Brachiopodi e dei Molluschi pliocenici dei dintorni di Bologna (continuazione)." *Boll. Soc. Mal., Ital.*, vol. xviii., 1893 (pub. Aug., 1895), pp. 241-413.
- Franchis, Filippo de.**—"Descrittione comparativa dei Molluschi post-plioxenici del bacino de Palazina (continuazione)." *Boll. Mal. Ital.* vol. ix., 1894 (pub. August, 1895), pp. 105-222, pls. 1-3.

Hall, T. S., and Pritchard, G. B.—“The Older Tertiaries of Maude with an indication of the sequence of the Eocene rocks of Victoria.” Roy. Soc. Victoria, vol. vii., 1895, pp. 183-196.

Contains list of fossil mollusca.

Harris, Gilbert D.—[See under “SYSTEMATIC WORK,” Tertiary Mollusca from Texas.]

Kennedy, William.—“The Eocene Tertiary of Texas, east of the Brazos River.” Proc. Acad. Sci. Philad., 1895, pt. i., pp. 89-160.

Lists of shell occurring in the various sections described are given.

Pritchard, G. B.—“Contributions to the Palaeontology of the older Tertiary of Victoria, Lamellibranchs, part i.” Pro. Roy. Soc. Victoria, vol. vii., pp. 225-31, pl. xii.

New spp. *Trigonia tatei*, *Myochama trapezia*, *Pinna cordata*, *Cardita maudensis*, and *Chione halli*, all figured.

Tate, R.—“Notes on the organic remains of the osseous clays at Lake Callabonna,” Trans. Roy. Soc. S. Australia, vol. xviii., 1894, pp. 195-6.

New species:—*Blandfordia* [*Coxiella*, Smith] *stirlingi* and variety *mamillata*, no fig.

Webb, Wilfred Mark.—“Note on the shells from the brick-earth at Chelmsford.” Essex Nat., vol. ix., 1895, pp. 19-20.

A newly-described deposit containing:—*Pupa muscorum*, *Succinea elegans*, *S. oblonga*; *Lymnaea pereger*, *L. falustris*, *L. truncatula*; *Planorbis marginatus*, *P. spirorbis*.

COLLECTING AND USE.

Bavay.—“Récolte des mollusques (conseils aux voyageurs).” Feuille Jeunes Nat., 1895, pp. 137-142 and 161.

Etheridge, R.—“The Kuditcha shoes of Central Australia.” P.L.S., N.S.W., 2, vol. ix., pp. 544-550.

The slippers are stuffed with shells of *Hadra f. inflata* whose snail is eaten.

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NOTES.

* **Shells and Superstitions.**—Apropos of Mr. Finn's note, the following may be worthy of record :—

A European had rendered some service to a chief of Erromanga, New Hebrides. As a token of gratitude the latter presented to him a charm to ensure good fortune, much esteemed by the natives. This consisted of a single normal specimen of *Turricula vulpecula* carefully wrapped in a piece of Tappa cloth.—J. JENNINGS, Australian Museum.

Sydney, N.S.W., June 9th, 1895.

Importation of Foreign Land Molluscs.—As affording some idea of the various modes by which foreign species of molluscs may be imported, the following is worth recording :—During the last summer, whilst screening a quantity of Smyrna beans, large numbers of snail-shells were discovered in the refuse, some of these have lately come into my possession and belong to *Helix lactea* and *Helix candidissima*. Whether or not any of the specimens were alive on their arrival at Bishop's Stortford I have not been able to ascertain, but there appears to me to be no reason why living specimens should not be thus imported. Inquiries are being made with regard to this, and perhaps later, more definite information may be obtained.

FRANK HUGHES.

The Toheroa and its Enemies.—There is a bivalve found on the coast (Wairoa) called Toheroa: it is found in the sand on the shore only where *fresh-water* runs across the beach. When the tide rolls in, the animals anchor themselves by a long tongue and the shells stand up in the sea-water—you may see them like tulips in a garden-bed. The birds of the shore are ready, and every now and then, down one drops, catches a Toheroa and rising up fifty feet or so, drops it on the hard sand and follows quickly to find the shell smashed, but often another sea-gull is there first and they have an argument about the matter. There is also a fish called "*Schnapper*" which makes a business of catching the bivalves, the fish come in shoals to where the Toheroas are found, and you can see their tails sticking up like grass in a field as they gulp down the poor things. These Schnappers are furnished with a pair of jaws like a stone-crusher, and boys and men catch them with a line and strong hook baited with a Toheroa and good they are to eat. The Toheroas are dug out like potatoes, and though they have many enemies they must increase very, very fast, for two inches below the surface there is often a layer three or four deep. The Maories go with pack-horses to fetch them.—SAMUEL WEBB, *Rockvale, Whakahara, June 19th, 1895.*

[It would be interesting to learn the specific name of the bivalve.—ED.]

New British Marine Shells.—*Rissoa subsoluta*, Aradas.—I had overlooked a specimen of this shell, dredged in 1890, off Menavawr Rock, on the Atlantic side of the Scilly Islands in 40 fathoms. It was taken with *R. jeffreysi*, *Odostomia compactilis*, *Utriculus expansus* and other species hitherto recorded only from the Shetlands. Although a difficult place to reach, and still more difficult to dredge at, more specimens will probably be found about the district, as it was taken in the Porcupine Expedition on the Atlantic slope off the Scillies, in 539 fathoms, and at the entrance to the British Channel in 690-717 fathoms.

My specimen is as fresh as if living and differs from the Mediterranean form in that the sculpture is coarser, and that the longitudinals and spirals

are more uniform, instead of the former predominating, making it appear reticulated like *R. testae*, just as I find in one of the Porcupine specimens from the Atlantic, off Scilly. I have previously noticed the tendency of Scillonian *Rissoae* to run coarse.

Jeffrey's figures in the Porcupine Report, which are otherwise good, show fine spiral sculpture on the lower part only, of each whorl; but these spirals should appear throughout the three sculptured whorls, the apex being smooth and polished. The species is very variable as regards the sculpture, some specimens having little or no traces of longitudinal ribs, but the fine spirals are always present throughout.

It may be considered a decidedly deep-water species, its Mediterranean range being 108-310 fathoms; but in the Porcupine Expedition it occurred at depths exceeding 1000 fathoms. The Scilly record of 40 fathoms must, therefore, be considered exceptional.

Some other notes by me regarding this species will be found in the "Journal of Conchology" for January and April, 1895.

J. T. MARSHALL.

[The above is an addition to Mr. Marshall's paper in the last number—Ed.]

OBITUARY.

Miss Saul, who died a week or so ago, has bequeathed her collection to the University of Cambridge.

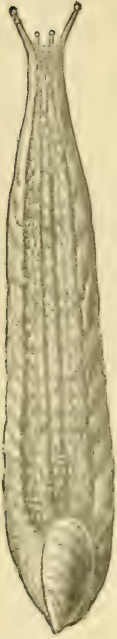
The death is announced of J. Kostal, Assistant in the Bohemian Polytechnicum, on September 26th, at Prague.

EDITORS' NOTES.

We are sorry to say that no response whatsoever has been made to the appeal for subscribers, printed on page 2 of the cover of the last two numbers, and we would ask those readers who are really interested in the success and well-being of the Journal, to obtain at least one other subscriber.

BRITISH TESTACELLAE, extended and contracted.

Life-size.



1



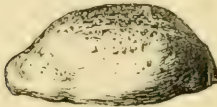
2



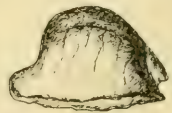
3



4



5



6

Testacella maugei,
Fér.

Testacella scutulium,
Sow.

Testacella haliotidica,
Drap.

SHELLS OF BRITISH TESTACELLAE, seen from above and below.

Enlarged twice, linear.



Testacella maugei, Fér.

This shell is large, and being markedly convexo-concave, will not be easily confounded with either of the other species.



Testacella scutulium, Sow.

The dorsal surface of the shell is flat, and even somewhat concave towards the edge away from the columella, which ends abruptly and has a more or less sharp edge.



Testacella haliotidea, Drap.

The shell is more massive, is pearly on the inside, and is not so pointed anteriorly, while the columella is flattened and broadened, especially under the apex of the shell.

T H E
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Vol. IV.

PURPURA CORONATA, LAM. IN THE WEST
INDIES.

By the REV. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

Shells of a dwarfed form of *Purpura coronata*, Lam., have been in my possession for the last few years, having been brought back from Demerara in alcohol, with the animal inside, by a near relation. During a recent visit to the British Museum, Mr. Edgar Smith showed me some specimens of a *Purpura* which I immediately recognized as identical with those above-mentioned, and which had, in fact, been sent to him from Demerara for identification. Still more recently I received from Mr. R. J. L. Guppy, a bottle of marine shells taken alive on the coast of Trinidad, among which were a number of specimens of the typical *P. coronata*.

It appears to me worth while formally to notify the occurrence of this common West African species on the South American coast. In the Demerara form, which is so well marked as almost to require special notification as a variety, the shell is smaller than the type, and not nearly so squarely

massive, spire more elevated, tubercles faintly marked, and in some cases evanescent, the whole shell not presenting, except at the extreme apex, that curiously waxen appearance which is so characteristic of the type. On the other hand, the curiously ribbed suture and peculiar umbilicus are well marked. The shell presents the general appearance of a form occurring on a muddy foreshore, which is, I believe, its actual habitat. It occurs in company with *P. floridana* Conr., and *Littorina columellaris* Orb. The specimens from Trinidad are in all respects typical.

It is a singular fact that a shell of the size and abundance of *P. coronata* should not have been hitherto noticed from this locality, and it is quite possible that the species has not long established itself on the coast, in which case it will be interesting to trace the time and area of its eventual extension. The type has been hitherto exclusively characteristic of western tropical Africa, but the north and south range of the species does not appear to have been ascertained with accuracy.

Into the interesting question of the relation of the E. American and W. African tropical fauna, which is significantly hinted at in the occurrence of this species on both sides of the Atlantic, I do not now propose to enter. It is well known that the larva of a certain *Purpura* is pelagic (in which form, indeed, it has been more than once described as a new genus), and there can be little doubt that the larval form of the species in question has been carried across the Atlantic by the equatorial current which sets westward from Cape Palmas.

In the list of St. Helena mollusca, given by Mr. Edgar Smith in P.Z.S., 1890, p. 250, out of 177 species, 42, or about 24 per cent, also occur in the West Indies. Scarcely more than half-a-dozen of these, however, appear to be littoral species.

NOTES ON THE TERRESTRIAL MOLLUSCAN FAUNA OF NEW CALEDONIA,

By E. RUTHVEN SYKES, B.A., F.Z.S.,

Honorary Secretary of the Malacological Society.

WE have to congratulate Mons. Crosse on the recent publication* of the first part of his excellent study on the fauna of New Caledonia. This has induced the writer to put together the following notes, the result of a study of that fauna made some time ago, in conjunction with Mr. Ponsonby. The responsibility for this publication, however, must rest with the writer.

Speaking of *Rhytida kanakina*, Gassies, Mons. Crosse remarks (p. 185) "De plus, les conditions dans lesquelles s'est effectuée la dispersion de ses collections néo-caledoniennes, rendent absolument incertaine la ressource de la consultation "du type." Any record, therefore, of these types of Gassies is of interest: the British Museum, at the sale of his collection, acquired a considerable portion of the shells from New Caledonia, and amongst them were the following Helicoid land-shells, most of which are type specimens:—

<i>Diplomphalus cabriti</i>	<i>Charoſa melaleucarum</i>
<i>Rhytida multisulcata</i>	" <i>vetula</i>
" <i>luteolina</i>	" <i>rusticula</i>
" <i>lamberti</i>	" <i>dispersa</i>
" <i>rufotincta</i>	" <i>decreta</i>
" <i>subnitens</i>	" <i>confinis</i>
" <i>testudinaria</i>	" <i>inculta</i>
" <i>raynali</i>	" <i>melitae</i>
<i>Hyalinia subfulva</i>	" <i>rhizophorarum</i>
" <i>savesi</i>	" <i>subcoacta</i>
<i>Microcystis bourailensis</i>	" <i>opaoana</i>
<i>Platyrhytida occlusa</i>	" <i>koutoumensis</i>
" <i>bruniana</i>	<i>Trochomorpha lalannei</i>
" <i>oriunda</i>	

There is also *Rhytida villandrei*, erroneously described from New Caledonia. The classification given above, is that of Mons. Crosse: Gassies, as is well known, usually describing his species as belonging to *Helix* or *Zonites*.

* Journ. de Conch., Tom xlii., No. 3, pp. 161-332, pl. vii.-viii., Oct., 1895.

It is worth while, too, remarking that the *Helix aulacospira*, Pfeiffer (1846), is, from an examination of the type, specifically identical with the *Helix multisulcata* of Gassies (1857). This fact does not appear to have come to the notice of Mons. Crosse. Judging from figures and descriptions, as also from specimens in this country, it would appear also that *H. luteslina*, Gassies = *H. deplanchysi*, and is another synonym of *H. aulacospira*.

One would have inclined, also, to place *H. yahouensis*, Gassies as a synonym of *H. multisulcata* (= *H. aulacospira*). Again, from an examination of the type of *Helix bisulcata*, Pfeiffer (1853), described as from Tasmania, it is clear that this species is identical with the *H. braudi*, Gassies (1858). Some doubt must be felt, too, as to whether Mons. Crosse is correct in separating *Rhytida cogniensis*, Crosse, and *R. paulucciae*, Crosse, from *R. testudinaria*, Gassies.

The *H. pinicola* of Gassies, Layard, &c., is not the *H. pinicola* of Pfeiffer. The type of this latter species (Mus. Cuming) is labelled as from the "I. of Pines" and probably does not really come from New Caledonia. It appears to me that the *H. pinicola* of Gassies is a synonym of the *H. costulifera*, Pfeiffer.

Referring to the *Platystoma*, Ancey, which Mons. Crosse quite correctly replaces by *Platyrhytida*, Cockerell, it may be pointed out that, in addition to the use of the name by Klein, *Platystoma* has been used by Meigen (1803, *Diptera*), Agassiz (1829, *Pisces*), Swainson (1837, *Aves*), while Conrad used *Platystoma* in 1842.

Mons. Crosse is thoroughly to be commended for having (p. 223) united *H. turneri*, *H. astur*, and *H. occlusa* into one species; the last two being only toothless forms of the former; they are correctly placed under *Platyrhytida*.

Mons. Crosse appears to have overlooked the fact, to which Mons. Ancey called attention in 1888, that when *Helix berlierei* was described there was also a *Helix berlieri*, Morelet, which took precedence. Though, of course, these two now are placed in different genera, still there were at one time two species in the same genus of the same name, and the rule of priority was violated.

Mons. Crosse also appears to be in ignorance of a paper by Dr. Boettger † in which the species of *Pupa* from New Caledonia were discussed; a new group, *Cylindrovertilla*, was proposed for

† In von. Martens, *Conch. Mitth.*, 1880, vol. i., pp. 45-72, taf., x.-xii.

P. fabreana and *P. paitensis*, and *P. artensis* was united with *P. pediculus*, Shuttl. A little note on the value of the name *Laimodonta* † (which he emends to *Laemodonta*), by the present writer, seems also to have escaped his notice.

In conclusion, it need only be remarked that it is very much easier to endeavour to find mistakes in such a catalogue than to compile it, and that only those who have studied a fauna, so difficult as that of New Caledonia, are able to appreciate the time and labour involved in the work, of which Mons. Crosse has so successfully completed the major portion.

† Journ. Mal., vol. iii., p. 73.

NOTES.

Locality of *Clausilia recondita*, Sykes.—This *Clausilia*, recently described (*ante*, vol. iii., p. 48), from Sumbawa, has now been found among some shells collected in Gilolo.

E. R. S.

***Arion hortensis*, var. *caeruleus*.**—I have recently received from Mr. B. B. Woodward a number of specimens of *Arion hortensis*, Fér., from his garden at Ealing. Amongst these I was interested in finding two examples of the var. *caeruleus*, which I described some years ago (*Conchologist*, 1892, vol. ii.). The most southernly record I have previously had was near Oxford, where I collected it in 1890.

WALTER E. COLLINGE, F.Z.S.

Note on *Scacchia eddytonia*, Marshall.—Having recently received a large quantity of sand, trawled off Plymouth, I examined it very carefully, in the hope of finding the small bivalve which Mr. Marshall described under the above name, in the "Journal of Malacology" for June last. A few valves were found agreeing exactly with Mr. Marshall's description and the admirable figures accompanying his paper (except that one valve is perfectly hyaline). But it was at once seen not to be a *Scacchia* at all, for although the shells closely resemble in shape *S. elliptica*, Scacchi of the same size, the hinge is utterly different. Moreover, the description given by Mr. Marshall is incorrect. The "two" cardinal teeth of which he speaks are really a single cleft cardinal, whilst his "lateral" is another simple cardinal. The hinge is, in fact, that of an absolutely typical *Diplodonta*. A reference to Jeffreys' "British Conchology" shows that the fry of *D. rotundata*, Montg., are evidently remarkable, for Jeffreys himself described young examples of the species, under the name of *Diodonta barleei*, in the "Annals and Magazine of Natural History" for 1858. The description of this *Diodonta barleei* is brief and the outline of the figure not very good, but the hinge is admirably shown, and it is easily identified with *Scacchia eddytonia*. I have been able to satisfy myself that it is in reality the fry of *Dip. rotundata*, Montagu, by an examination of the umbonal region of young specimens of the species kindly sent by my friend, Mr. H. K. Jordan, F.G.S.

Southport.

GEO. W. CHASTER.

THE BRITISH SPECIES OF TESTACELLA.

By WILFRED MARK WEBB, F.L.S.,

Staff-Demonstrator in Biology to the County Council of Essex.

It is now recognised that there are three species of *Testacella* to be met with in this country, to wit, *Testacella maugei*, Férussac, *T. haliotideæ*, Draparnaud, and *T. scutulum*, G. B. Sowerby. Of these molluscs, the two last are, at first sight, so much alike, that until recently, any shell-bearing slug not referable to Férussac's species was put down as *T. haliotideæ*.

The history of the separation of the third species is as follows:—

1823. In this year Mr. G. B. Sowerby* described *Testacella scutulum* as a distinct species, but, following the opinion of Férussac, British conchologists, including Sowerby himself, came to consider this form to be merely a variation of Draparnaud's species.

1856. Mr. Tapping† re-described the species under the name of *T. medii-templi*, his specimens being found in the Middle Temple gardens.

1885. The following is an extract from a letter written by the late Mr. Charles Ashford to the writer, with reference to the anatomical work on which the following paper was founded:—

“The results of the examination of *T. scutulum* were communicated to Mr. Taylor by letter. The first specimen, received through Mr. Roebuck and sent me at Mr. Taylor's request, was dissected in February, 1885, and was found to differ materially from Moquin-Tandon's figure of *T. haliotideæ*. Subsequent examples sent me by Mr. Taylor showed the difference to be constant.”

1888. The paper‡ to which the credit of re-establishing Sowerby's species really belongs was published in this

* Genera of Recent and Fossil Shells. 1823. Pl. clix.

† Zoölogist, 1856, p. 5105.

‡ On the specific distinctness and geographical distribution of *Testacella scutulum*, G. B. Sowerby. Journ. of Conch., vol. v., 1888, p. 337.

year; in it Mr. J. W. Taylor described the external characters of the two less easily distinguished species and the points of difference in the anatomy of their reproductive organs made out by Mr. Ashford, together with others in the radulae. To the paper was added an exhaustive account of the distribution of *Testacella scutulum* in the British Isles and elsewhere.

1893. On June 1st the present writer made some remarks before the Linnean Society* on the manner of feeding in *Testacella scutulum*, and gave the results of some anatomical work on this species which bore out Mr. Ashford's statements.

In the Annals and Magazine of Natural History for July, Mr. Walter E. Collinge† also confirmed Mr. Ashford's results, giving an exhaustive account and figures of the reproductive organs of all three species.

In his paper, Mr. Taylor expressed the hope that the full distribution of *T. scutulum* would be worked out, but, as the writer has already indicated,‡ by the separation of this species a doubt must be thrown upon the existing records for *T. haliotideae*, and the most important piece of work on the distribution of these slugs, is the obtaining of a reliable list of localities for the latter species, like the one given for the other form by Mr. Taylor.

With this end in view, the writer has been endeavouring, with the welcome help of the gardening and other papers,§ to obtain specimens of *Testacella* for careful determination. Up to the present, the effort has been productive rather of a number of individuals than of localities; but the abundance of material which has been collected, through the kindness of correspondents throughout Great Britain, has given to the writer the opportunity of doing some work that might have been undertaken when his observations were made on *Testacella scutulum*, but which had perforce to stand over on account of the difficulty then, and till now, experienced of obtaining *T. haliotideae*.

In the following papers the British species of *Testacella* will be briefly compared externally and anatomically, and later, the distribution will be dealt with, more particularly that of *T. haliotideae*.

* Proc. Linn. Soc., 1892-3, p. 28. A paper embodying the remarks alluded to was published in the Zoölogist, ser. 3, vol. xvii. (August, 1893), pp. 231-239, pl. i.

† Ser. 6, vol. xii., pp. 21-25, pl. i.

‡ Nature, July 26, 1894.

§ Gardeners' Chronicle, 1895. Gardening World, vol. xii., 1895, p. 89. Nature, vol. lii.

In the table below some of the more important external features of our *Testacellae* are set out, and with the help of Plates II. and III., on which the slugs and their shells are respectively figured, any of the British species should easily be determined.

EXTERNAL CHARACTERS.

	<i>Testacella maugei</i> , Fér.	<i>Testacella scutulum</i> , Sow.	<i>Testacella haliotideca</i> , Drap.
Shell. (For details and figures see <i>Plate III</i>).	Large, often half-an-inch in length or more; easily identified.	The smallest of the three species when adult, thin, covered with a brown periostracum.	In all but very young individuals it is solid looking and more or less weathered, showing rough lines of growth.
Skin.	Somewhat smooth, dorsal tubercles often distinct, lateral grooves fairly distinct.	Smooth, with slightly-marked lateral grooves.	Rougher, with distinct lateral grooves.
Colour of body generally.	Yellow, more or less marked & banded with brown.	More or less bright yellow & usually covered with tiny brown dots.	Not so pure a yellow, more or less tawny; dorsal lines and lateral grooves pigmented.
Of foot-sole.	Yellow.	Yellow.	Whitish.
Animal fully extended.	Heavily built, wider (proportionately) except towards the head, somewhat circular in cross-section. Dorsal lines do not meet in front of the shell.	Slender, of more uniform breadth. More circular in cross-section, owing to the swelling out of the body above the foot. (This is seen in <i>Fig. 5</i> .)	Gets more rapidly slender towards the head. Approximately triangular in cross-section. The dorsal lines enclose a more obtuse angle than in the preceding species.
<i>Plate II.</i>	<i>Fig. 1.</i>	<i>Fig. 2.</i>	<i>Fig. 3.</i>
Animal contracted	Cylindrical. Shell very evident, inclined in profile.	Cylindrical. Shell shows but slightly and is vertical in profile.	Conical. Shell evident and inclined in profile.
<i>Plate II.</i>	<i>Fig. 4.</i>	<i>Fig. 5.</i>	<i>Fig. 6.</i>

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Taylor, J. W., with the assistance of Roebuck, W. D., and Ashford, Chas. —“A monograph of the land and fresh-water mollusca of the British Isles.” Part II., Leeds, August 24th, 1895, pp. 65-128, pl. ii., 147 figs.

Mr. John W. Taylor is again to be congratulated on the result of the careful and really hard work which is to be seen in the second part of his monograph on British land and fresh-water shells, and when one begins to realize what such a labour must be, where the author is also the illustrator, one feels that one's time might, perhaps, be better spent in praising the many perfections than in pointing out the few faults. The present part is creditably printed and excellently illustrated, while the thoroughness of treatment and general clearness of style which contributed, in no small way, to the success of Part I., are very well kept up. The introduction of thicker paper for the plate is a decided improvement, and with the plate itself, as a whole, it would be very difficult to find any fault, so well have the tints and shading of the shells been reproduced by the artist and lithographers. It is also pleasant to see that the colour-printing has not been done “in Germany.”



FIGURE 151. *Lymnaea stagnalis*.

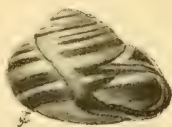


FIGURE 152. *Helix nemoralis*.

Showing transverse thickenings indicating growth checks sustained by the animal.

In the instalment under consideration, Mr. Taylor completes his account of variation in form, and proceeds to discuss variations of the shell in the character of the lip, in the armature of aperture, sculpture, periostracal appendages, and further differences in thickness, in form and in colour. Monstrosities of the shell and hyperstrophy are then considered, and finally “auxiliary organs”—viz., operculum and clausilium—are described.

It is to be expected that the introduction of varietal appellations which have been applied from time to time to casual variations will not find favour in the eyes of the present writer, who has always considered the retention of

such names to be the outcome of an inability to grasp the broad facts of Biology on the part of the describers, followed by the blindness of individuals who specialize without possessing a general knowledge of the science in which they dabble.

There is this to be said, however, that Mr. Taylor might have been more prodigal of varietal names than he has been, though the terminology that allows of the labelling of a large *Helix aspersa* "showing the effect of a favourable environment," var. *major*, while a small example of the same shell showing the reverse is termed, var. *minor*, must appear to most minds to be—well, one will say—rather eccentric. Whatever one's idea of varietal characteristics may be, surely one would not include such differences from the general form as are temporary, only affecting the individual and not its descendants, unless subjected to the same environment.

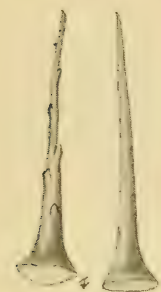


FIGURE 160.
Periostracal hairs
of *Helix granulata*,
Alder.

Figures 151 and 152 illustrate some of the remarks on shell aperture, while periostracal hairs are well shown by Figure 160.

Under the heading of colouring, much interesting matter has been brought together. It is to this part that Plate II. refers, and although the

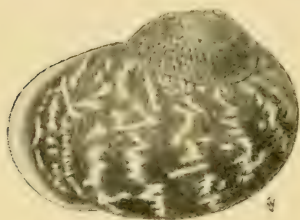


FIGURE 210. *Helix aspersa*, showing
"interrupted" bands.

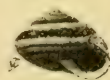


FIGURE 194. *Helix caperata*,
variation probably avoided
by sheep.

introduction of tropical shells may add to the brilliancy of the plate, yet the advisability of figuring foreign species in a British monograph may be questioned. An illustration of the distinctly marked variation of *Helix virgata*



FIGURES 229, 230, 231. *Linnæa pereger*, from a pool near Geneva.. Showing the deformation of the columella and base of the shell, assumed to be caused by *Hydra viridis*.

supposed to be avoided by sheep, grazing on the downs, is reproduced above Figure 210 is a handsome variation of *Helix aspersa*.

Monstrosities receive a good deal of attention, and some remarkable forms are figured, including specimens (see Figures 229, 230, 231) of *Limnæa*



FIGURE 238. An orthostrophic sinistral shell as *Physa*, showing the heart at the base of the whorl.



FIGURE 239. Intermediate sub-discoidal sinistral shell.



FIGURE 240. Discoid form as *Planorbis*.



FIGURE 241. Intermediate sub-discoidal pseudo-dextral shell.



FIGURE 242. A hyperstrophic pseudo-dextral shell as *Pompholix*. The heart is now seen to be at spire side of body wall.

Diagrammatic figures showing in a conventional and simple way the changes from an orthostrophic sinistral to a hyperstrophic pseudo-dextral one.

pereger, probably deformed by the attachment of *Hydra* to the mollusc. The figures illustrating hyperstrophy given above speak for themselves.

W. M. W.

Pilsbry, H. A.—Manual of Conchology, series 1, part 62 (contains vol. xvi., pp. 49-112, pls. 17-31); series 2, part 38 (contains pp. 49-96, pls. 16-25). November, 1895.

Will be reviewed later.

ANATOMY.

Clubb, Joseph A.—“Notes on some points in the structure of the cerata of *Dendronotus arborescens*.” Proc. and Trans. Liv. Biol. Soc., ix., pp. 220-234, pls. xiv.-xv.

Haller, B.—“Beiträge zur Kenntniss der Morphologie von *Nautilus pompilius*.” In Zoöl. Forschungsreisen in Australien, Bnd. 5, lief. 2, pp. 187-204, pls. xi.-xii.

Heymons, Dr. R.—“Beimærkungen zur der von v. Erlanger veröffentlichten ‘Etudes sur le développement des Gastéropodes pulmonés.’” Zoöl. Anz. Jahrg., xviii., no. 486, pp. 400-402.

Kerr, J. Graham.—“On some points in the anatomy of *Nautilus pompilius*.” Proc. Zoöl. Soc., 1895, pp. 664-686, pls. xxxviii.-xxxix., figs.

The author concludes that the nearest living allies of the *Cephalopoda* are to be sought for amongst the Chitons. He is drawn to this result from a consideration, *inter alia*, of the bilateral symmetry, the general relations of the coelome and nephridia, and the fact that the eggs are developed within follicles.

Owsjannikow, Ph.—“Die Blutkörperchen der Flusskrebse (*A. fluviatilis* et *A. leptodactylus*) und der Teichmuschel (*Anodonta*).” Bull. Acad. Imp. Sci., St. Pétersbourg, ser. v., tome 2, pp. 365-382, pl.

Woodward, Martin F.—"Note on the anatomy of the larva of the European oyster, *Ostrea edulis*, Linn." Proc. Mal. Soc., vol. i., 1895, pp. 297-299, pl. xx.

See *ante*, p. 51. My specimens in very few cases showed the alimentary canal, and it was for this reason that help was sought from those belonging to the Royal College of Science, in order to locate the structure presumed to be the "posterior adductor" muscle.

W. M. W.

PHYSIOLOGY AND BIOLOGY.

Baring, Hon. Cecil, and Grant, W. R. Ogilvie.—"An expedition to the Salvage Islands" (from "The Field" of Sept. 21st and 28th, 1895). Zoöl., ser. 3, vol. xix., 1895, Mollusca, pp. 403-404.

Seven shells of *Helix pisana* found in the stomach of a kestrel, *Helix faufereula* apparently forms the chief food of a tarantula (*Lycosa maderiana*).

Bowell, E. W. W., and Bazeley, E. H.—"On Banded Snails." Devonian, vol. i., part 1, Oct. 1895, pp. 17-21, figs.

Carazzi, D.—"Green Oysters." Nature, vol. lii., p. 643.

Herdman, W. A.—Presidential Address to the Zoölogical Section of the British Association, 1895.

Kofoed, C. A.—"On the early development of *Limax*." Bull. Mus. Comp. Zoöl., vol. xxvii., no. 2, pp. 35-118, pls. i.-viii.

Leighton, T.—"Notes on two cases of transport and survival of terrestrial mollusca in the New Forest." Proc. Mal. Soc., vol. i., 1895, p. 296.

Letellier, A.—"Une action purement mecanique permet d'expliquer comment les *Clione* creusent leurs galeries dans les valves des huîtres." Bull. Soc. Linn. Normandie, ser. 4, tome viii., pp. 149-166.

Mosley, S. L.—"Boring shells and other animals." Nat. Journ., vol. iv., pp. 257-259.

Simroth, Dr. H.—"Die Gastropoden der Plankton Expedition." Kiel and Liepzig, 1895, pp. 1-206, pls. xx., figs.

Relates to embryonic shells, most of which the author is unable to identify with certainty.

Webb, Wilfred Mark.—"Protective colouration in British Clausilias." Sci. Goss., new series, vol. ii., Dec., 1895.

FAUNA.

Allen, E. J.—"Faunistic Notes: January to June, 1895." Journ. Mar. Biol. Assn., vol. iv., pp. 48-52. Mollusca at p. 51.

Anon.—"By the way." Devonian, vol. i., part ii., p. 56.

Anon.—"Large *Dreissena polymorpha*." Nat. Journ., vol. iv., p. 206.

Bendall, Wilfred.—"A list of the land mollusca of the island of New Providence, Bahamas, with an enumeration of the species recorded from the other islands." Proc. Mal. Soc., vol. i., 1895, pp. 292-295.

B[owell], E. W. W.—"Occurrence of *Helicella fusca*, Mont. (near Bampton, N. Devon)." Devonian, vol. i., part ii., p. 49.

Butterell, J. Darker.—"*Tectura testudinalis* on the Yorkshire Coast." Natural., No. 245, Dec., p. 346.

Collinge, Walter E.—"Notes on some slugs from Algiers." Proc. Mal. Soc., vol. i., 1895, pp. 336-337, pl. xxiii.

Amalia ater and *A. maculata*, new species.

Crosse, H.—"Faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances." *Journ. de Conch.*, vol. xlii., no. 3, pp. 161-332, pls. vii.-viii., October, 1895.

Dall, William Healey.—"Report on mollusca and brachiopoda dredged in deep water chiefly near the Hawaiian Islands, with illustrations of hitherto unfigured species from North-west America." Scientific results of explorations by U. S. Fish Commission steamer Albatross, No. xxxiv. *Proc. U. S. Nat. Mus.*, vol. xvii., pp. 675-733, pls. xxiii.-xxxiii.

Many new species.

Gabriel, Jos.—"Marine dredging excursion." *Victorian Nat.*, vol. xii. July, 1895, pp. 39-42.

Godwin-Austen, Lt.-Col. H. H.—"List and distribution of the land-mollusca of the Andaman and Nicobar Islands, with descriptions of some supposed new species." *Proc. Zool. Soc.*, 1895, pp. 438-457, figs.

This is one of those studies of island faunas which in a very great measure are the indispensable guides of working naturalists. It is interesting to note how little we yet know of these islands. For instance, Mr. Cooke, in his recent work (at p. 306), has stated that in the Nicobars the land operculates outnumber the pulmonates; turning to Col. Godwin-Austen's paper, we see that the reverse is really the case, as the Helicacea number 43, while the operculata are only 29 all-told. Again, Col. Godwin-Austen extends the range of *Amphidromus* to the Nicobars, while Mr. Cooke gave it as only being from the Andamans. New species are described belonging to the following genera:—*Sitala*, *Planispira*, *Pupa*, *Vaginulus*, *Acmella*, *Cyathopoma*, *Omphalotropis*. The general notes on species are also very interesting. There is a slip in the arithmetic of the table at the end, for if there be 74 species in the Andamans and 72 in the Nicobars, of which 8 are common, this cannot give a total of 137. We leave our readers to find out whereabouts in the table the error is.

E. R. S.

Hedley, C.—"On the Australasian *Gundlachia*." *Nautilus*, vol. ix., Oct. 1895, pp. 61-8, fig.

Taken in the main from Mr. Hedley's paper in *Proc. Linn. Soc.*, N.S.W. vol. viii., 1893: there are some notes added by Mr. Pilsbry on the American species.

Hume, W. F.—"Oceanic deposits ancient and modern, part ii. The Mollusca." *Nat. Sci.*, vol. vii., pp. 385-394.

Imhof, Dr. Othm. Em.—"Summarische beiträge zur kenntniss der Aquatilia Invertebrata der Schweiz." *Biol. Centralblatt*, Bnd. xv., Oct. 1895, pp. 713-719.

Contains three capital tables with prefatory remarks. The tables relate to distribution—(a) by watersheds, (b) by altitudes.

Iwakawa, T.—"Fresh-water mollusca of Japan." *Zool. Mag.*, Tokyo, vol. vii., no. 8, 1 pl. In Japanese.

Kingsley, R. J.—"Zoological notes, *Paryphanta hochstetteri*, found at low levels at West Wanganui." *Trans. N. Z. Inst.*, 1894, xxvii., p. 239.

Locard, A.—"Notices Conchyliologiques, No. xxxii., une coquille Française méconnue." *L' Echange*, Rev. Linneenne, ann. xi., pp. 85-6.

Long, F. C.—"Shell-collecting around Whalley." *Nat. Journ.*, vol. iv. pp. 273-4.

Melville, James Cosmo, and Standen, Robert.—"Notes on a collection of shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with a list of species" (continued). *Journ. of Conch.*, viii., 1895, pp. 89-128, pls. ii. and iii. (not finished).

The complete paper of 130 pages and two pages of addenda has been

issued separately as one of the Manchester Museum handbooks, under the title of the "Catalogue of the Hadfield Collection of Shells from Loyalty Islands," Manchester, 1895 (price 1s.).

Milne, J. N.—"*Helix arbustorum* in Armagh." Irish Nat., vol. iv., p. 348.

Pilsbry, Henry A.—"Catalogue of the Marine Mollusks of Japan, with descriptions of new species and notes on others collected by Frederick Stearns." Pub. by F. Stearns, Detroit, 8^{vo}, pp. i.-viii., 1-196, pls. i.-xi., Oct., 1895.

The Marine Molluscan Fauna of the Japanese Seas has been studied by many writers, notably Dunker, Lischke and von Schrenck, and we have now to welcome a work by Mr. Pilsbry. Naturally, as being the latest, this is by far the most complete, containing, as the author remarks, "about 500 species more than Dunker's *Index*, although a considerable number of forms enumerated by him are herein considered synonyms, or are rejected from the Japanese list." The book is far more than a bare catalogue of species; it contains much original work, such as the study of *Umbonium* and the limpets, the placing of *Fissurella* under the *Emarginulinae*, the use of such names as *Macroschisina macroschisina*, &c. Various new species are described, amongst them *Sepia hercules*, which contains a shell nearly 17 inches long. There is one point to which we must take objection, namely, the describing of species (e.g., *Clausilia stearnsii*) without any note that the descriptions have already been published. Both the author and publisher are to be congratulated on the general "get-up" of the book and on the lithographic plates. E.R.S.

Pritchard, G. B.—"Marine dredging excursion." The Victorian Naturalist, vol. xii., July, 1895, p. 40.

Notes on mollusca in Port Phillip.

Quadras, J. F., and Moellendorff, O. F. von.—"Diagnoses specierum novarum ex insulis Philippinis." Nach. Mal. Ges., 1895, pp. 137-153.

Scharff, R. F.—"An addition to the Irish molluscan fauna." Irish Nat., vol. iv., p. 335, fig.

The somewhat doubtful new species, *Pisidium hibernicum*, Westerlund.

Service, Robert.—"The shell slug in Scotland." Zoölogist, vol. xix., p. 436. *Testacella haliotidea* found in Sang's nursery in Kirkcaldy.

Smith, Edgar A.—"Report on the land and fresh-water shells collected by Mr. Herbert H. Smith at St. Vincent, Grenada, and other neighbouring islands." Proc. Malac. Soc., vol. i., 1895, pp. 300-322, pl. xxi.

Smith, Edgar A.—"On a small collection of land-shells from Central Africa." Proc. Malac. Soc., vol. i., 1895, pp. 323-328, figs.

Standen, R.—"Report of the Galway Conference and excursion of the Irish Field Club Union, 1895. Mollusca." Irish Nat., vol. iv., pp. 264-270.

Stossich, Prof. Adolpho.—"Molluschi osservati e raccolti fra la Alpi Venete." Boll. Soc. Adriat. Sci. Nat., xvi., pp. 197-210.

A very useful faunal catalogue.

Swanton, E. W.—"Notes on British land and fresh-water shells." Nat. Journ., vol. iv., p. 260-1.

Tomlin, B.—"*Spirula peronii* in co. Antrim."—Irish Nat., vol. iv., p. 348.

Travers, W. T. L.—"Notes on the larger species of *Paryphanta* in New Zealand, with some remarks on the distribution and dispersal of land-shells." Trans. N. Z. Inst., 1894, xxvii., pp. 224-228.

Ulicny, Josef.—"Einige neue formen der mollusken fauna von Böhmen." Verh. Nat. Ver. Brünn., Bnd. xxxiii., pp. 107-8.

Walker, Bryant.—"Review of our present knowledge of the molluscan fauna of Michigan." Detroit, 1895, 27 pp., 8^{vo}.

Warren, Amy.—"*Lepton sykesii*, Chaster, in Killala Bay." Irish Nat. vol. iv., p. 348.

SYSTEMATIC WORK.

Dall, W. H.—"Note on the genus *Jeannisia*." *Nautilus*, vol. ix., p. 78.

In April, 1895, the author proposed this name for two bivalves from the Philippine Islands; it now having come to his knowledge that the name had already been used, he proposes to replace it by *Jeannisiella*.

Godwin-Austen, Lt.-Col. H. H.—"Description of a supposed new species of land-mollusk of the genus *Pyramion* from Pulo Laut, an island off the south-east coast of Borneo." *Ann. Mag. N. H.*, ser. 6, vol. xvi., pp. 434-7, pl. xix., Dec. 1895.

Hector, J.—"On a new shell (*Anomia walteri*)." *Trans. N. Z. Inst.*, vol. xxvii., 1894, pp. 292-3.

As no figure is given or comparison with other members of the genus instituted, the only and insufficient claim of this species appears to be the habitat.

Hedley, C.—"*Dendrotrochus*, Pilsbry, assigned to *Trochomorpha*." *Rec. Austral. Mus.*, vol. ii., no. 6, pp. 90-1, pl. xxi.

This recently-described group is removed by Mr. Hedley from *Papua* and placed in *Trochomorpha*, upon anatomical grounds.

Hedley, C.—"*Pterosoma*, Lesson, claimed as a Heteropod." *Proc. Malac. Soc.*, vol. i., 1895, pp. 333-335, figs.

Joussemae, Dr.—"Description de coquilles nouvelles." *Le Nat.*, An. xvii., no. 203, p. 187.

Four new bivalves from Aden.

Kobelt, Dr. W.—"Iconographie der land und süßwasser mollusken von E. A. Rossmässler, fortgesetzt von Dr. W. Kobelt." *Neue folge*, Suppl. Bnd. i., lief. 3 and 4, pp. 33-48, pls. 1a, 7, 7a, 9, 13-18. Oct., 1895. Several new *Helices*, principally from Bourguignat's M.S.

Kobelt, Dr. W.—"Systematisches Conchylien-cabinet." Bnd. iii., Heft. lii., lief. 416, Oct. 1895.

Contains pp. 177-216, pls. 25-30, relating to *Columbella*. No new species.

Locard, Arnould.—"Etude sur la collection conchyliologique de Draparnaud." Paris, 1895, 8vo., pp. 190.

What Mons. Locard has endeavoured in this work to do is best described in his own words, namely, "Nous allons, à notre tour essayer de faire pour Draparnaud, le créateur de la Conchyliologie Française, ce que Hanley a si bien fait pour l'immortel Linné." It is curious to note from the author's pages how few of the great French collections still remain in their native country. Draparnaud's is now at Vienna; those of Lamarck and Delessert at Geneva; while those of Moquin-Tandon and Dupuy are scattered to the winds. It will be fresh in the minds of our readers that Morelet's and the pick of Gassies' are now in this country. E. R. S.

Melville, J. Cosmo, and Ponsonby, J. H.—"Descriptions of five new species of *Ennea* from South Africa." *Ann. Mag. N. H.*, ser. 6, vol. xvi., pp. 478-480, pl. xviii., Dec. 1895.

Mitsukuri, K., and Ikeda, S.—"Gigantic cephalopod from Japan." *Zoöl. Mag.*, Tokyo, vol. vii., no. 2.

Moellendorff, Dr. O. F. von.—"Pilsbry's neue Eintheilung der Heliciden." *Nach. Mal. Ges.*, 1895, pp. 153-165.

The first part of a very instructive criticism of vol. ix. of the *Manual of Conchology*.

Newton, R. Bullen.—"On some new species of British Eocene Gastropoda, with remarks on two forms already described." *Proc. Mal. Soc.*, vol. i., 1895, pp. 326-332, pl. xxii.

Pilsbry, H. A.—"A new Mexican *Bythinella*." *Nautilus*, vol. ix., Oct. 1895, pp. 68-9.

Pilsbry, H. A.—"*Epiphragmophora californiensis*, var. *contracostae*." *Nautilus*, vol. ix., Oct. 1895, p. 72.

Pilsbry, H. A.—"*Epiphragmophora remondi*, Tryon." *Nautilus*, vol. ix., Oct. 1895, p. 72.

E. verrilli, Ancey = *E. remondi*, which latter is distinct from *E. carpenteri*.

Pilsbry, H. A.—"On *Dolabella californica*, Stearns." *Nautilus*, vol. ix., pp. 73-74.

The first published description of the animal of this species. Mr. Pilsbry proposes a new sub-family, *Dolabellinae*, to contain the genus.

Schwarz, Ernest H. L.—"*Spirula peronii*, Lam." *Journ. Mar. Zool.*, vol. ii., Oct. 1895, pp. 25-30.

The author deals with the embryonic and general shell-structure. He concludes that *Spirula* has been derived from the Belemnites through *Spirulirostra*. Surely the memoir by Huxley and Pelsener, published last spring in the "Challenger" Reports, might have reached him.

Smith, E. A.—"Description of five new species of land shells from New Guinea." *Ann. Mag. Nat. Hist.*, ser. 6, vol. xvi., pp. 362-5, pl. xx.

Sollas, W. J., and Praeger, R. Lloyd.—"Notes on glacial deposits in Ireland." *Irish Nat.*, vol. iv., pp. 321-9.

Sterki, Dr. V.—"Descriptions of new *Pisidia*." *Nautilus*, vol. ix., pp. 74-6.
P. walkei and *P. politum*, n.spp., from the United States.

Verco, J. C.—"Descriptions of new species of marine mollusca of South Australia." "A revision of the recent Gasteropods of South Australia." *Trans. Roy. Soc. S. A.*, 1895, vol. xix., pp. 84-107, pls. i.-iii.

In Australia, Dr. Verco has for several years been known as an ardent and successful collector, and in these papers we welcome as a recruit to the ranks of conchological writers one who joins much practical experience of the dredge to clear and careful literary work. The first article describes as new *Murex tatei*, *M. robustus*, *Trophon angustus*, *T. levis*, *Latirus aurantiacus*, *L. pulleinci*, *Crassatella producta* and *C. micra*; re-described is *Triton mimeticus*, Tate. All these were dredged off the coast of South Australia, and all, we observe with satisfaction, are well illustrated. The second article commences a review, with especial attention to synonymy and distribution, of the marine gasteropoda of the colony, the Muricidae and Tritonidae being here discussed. Drawings of the radula of nine species are appended.

Wagner, Ant.—"Eine kritische studie über die arten des genus *Daudebardia*, Hartmann, in Europa und Asien." *Anz. Kais. Akad. Wiss. Wien*, 1895, vol. xiv., p. 138.

Some new names, with no descriptions.

PALAEONTOLOGY.

Anon.—"Geology at the British Association." *Nature*, vol. lii., pp. 558-561.

Bigot, A.—"Contributions a l'étude de la Faune Jurassique de Normandie: sur les *Opis*." *Mém. Soc. Linn. Normandie*, tome xviii., pp. 153-192, pls. viii.-ix.

Several new species, also a review of the group.

Bohm, Johs.—"Die Gastropoden du Marmolatakalkes." *Palaeontograph.*, Bnd. xlii., pp. 211-308, 7 plates, figs.

Many new species and some new genera.

James, J. F.—"The first fauna of the earth." *Amer. Nat.*, xxix., pp. 979-985, figs.

- Hind, Wheelton.—“A monograph on *Carbonicola*, *Anthyraomya* and *Naiadites*.” Part 2, pp. 81-170, pls. xii.-xx. (Palaeont. Soc., vol. xlix.)
- Hudleston, W. H.—“Jurassic *Gasteropoda*.” Part 1, no. 8, pp. 391-444, pls. xxxiii.-xl. (Palaeont. Soc., vol. xlix.)
- McHenry, H., and Watts, W. W.—“Guide to the collection of rocks and fossils belonging to the Geological Survey of Ireland.” Dublin, 8^{vo}, pp. 155.
- Praeger, R. Lloyd.—“The raised beaches of Inishowen.” Irish Nat., vol. iv., pp. 278-285.
- Rzehak, Anton.—“Über einige neue fossilen fundorte im Mährischen miocän.” Verh. Nat. Ver. Brunn, Bnd. xxxiii., pp. 252-262.

COLLECTING AND USE.

- Bavay.—“Conservation et preservation des mollusques.” Feu. Jeun. Nat., ser. iii., an. 26, no. 302, pp. 19-22.
- Bowell, E. W. W., and Bazeley, E. H.—“British land and fresh-water shells.” *Devonia*, vol. i., part i., pp. 3-8, pl. ii., Oct. 1895; part ii., pp. 34-9, pls. iii.-iv., Nov. 1895.
- Turner, Edwin E.—“*Helix nemoralis* as ornament.” Sci. Goss., 1895, p. 222.

BIBLIOGRAPHY.

- Simroth, Prof. H.—“Neuere Arbeiten ueber Morphologie der Pulmonaten.” Zoöl. Centralblatt, Jahrg. ii., pp. 321-333.
- Simroth, Prof. H.—“Neuere Arbeiten ueber Prosobranchien.” Zoöl. Centralblatt, Jahrg. ii., pp. 481-4.
- Simroth, Prof. H.—“Neuere Arbeiten ueber Opisthobranchien.” Zoöl. Centralblatt, Jahrg. ii., pp. 513-5.
- Simroth, Prof. H.—“Neuere Arbeiten ueber die Verbreitung der Gastropoden.” Zoöl. Centralblatt, Jahrg. ii., pp. 544-550.
- Simroth, Prof. H.—“Einige Neuere Arbeiten ueber Pulmonaten.” Zoöl. Centralblatt, Jahrg. ii., pp. 577-580.
- Woodward, B. B.—Record of the literature on the mollusca for 1894, occupying 87 pages of the Zoölogical Record for 1894, published by the Zoölogical Society of London, 1895.

Mr. B. B. Woodward has done his work even more thoroughly than in the previous years of his recordership.

BIOGRAPHY.

- Anonymous.—“Professor Sven Loven.” Geol. Mag., n.s., Dec. 4, vol. ii., p. 480.

EDITORS' NOTES.

Messrs. Beddard and Haddon have written a paper, which will shortly appear in the Zoölogical Society's "Transactions," containing descriptions of a number of new species of Nudibranchiata from the Torres Straits.

We welcome the first and second numbers of a bright little monthly magazine entitled "Devonia," edited by E. W. W. Bowell and E. H. Bazeley, of Huntsham, Bampton, North Devon. We must confess, however, that we have more liking for the matter in it than the manner of its production.

Students of marine life may be interested to hear that H.M.S. Penguin recently ran out 4,900 fathoms of line and found no bottom in lat. 23° 40 S., long. 175° 10 W.

We are pleased to hear that Mr. Edgar A. Smith has been chosen as one of the new Assistant Keepers of Zoölogy at the British Museum.

The kindly notice of the Journal by the editor of the "Gardening World" is much appreciated by us.

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The Rev. George Bailey, F.R.M.S.
Francis A. Bather, M.A., F.G.S.
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INDEX TO VOLUME IV.

	PAGES.
AGNATHA, Habits of the W. M. Webb	50
<i>Amalia parryi</i> , a supposed new species W. E. Collinge	7
<i>Arion hortensis</i> , var. <i>caeruleus</i> W. E. Collinge	73
BAILEY, G., Mess-mate of <i>Limnaca stagnalis</i> , 8.	
Variations in Radulae, 52.	
Bather, F. A., Habits of the young <i>Sepia</i>	33
British Marine Shells, New J. T. Marshall	35, 67
CHASTER, G. W., Notes on the less known British Marine Mollusca, 55. Note on <i>Scacchia caddytonia</i> , Marshall, 73.	
<i>Clausilia recondita</i> , Sykes, locality of E. R. S.	73
<i>Cassidaria</i> and <i>Oniscia</i> , Notes on the generic terms .. E. A. Smith	11
Cooke, Rev. A. H., <i>Purpura coronata</i> , Lam., in the West Indies ..	69
Cooke's Molluscs (Review) W. M. W.	40
Collinge, W. E., <i>Amalia parryi</i> , a supposed new species; 7.	
Description of a new species of <i>Limax</i> from Ireland, 6	
<i>Arion hortensis</i> , var. <i>caeruleus</i> , 73.	
Crayford, New Pleistocene Mollusca from A. S. Kennard	29
Current Literature—	
Anatomy	19, 43, 60, 79
Bibliography	49, 66, 85
Biography	29, 49, 66, 85
Biology	21, 44, 61, 80
Collecting	28, 49, 66, 85
Culture	28, 49
Fauna	22, 44, 62, 80
Index	66
Malacology in General	19, 40, 60, 77
Palaeontology	27, 48, 65, 84
Physiology	21, 44, 61, 80
Systematic Work	25, 46, 63, 83
Use	66, 85
Variation	65
DALL'S Tertiary Fauna of Florida (Review) W. E. C.	44
Description of a New Species of <i>Limax</i> from Ireland .. W. E. Collinge	4
Di-myarian Stage of the "Native" Oyster W. M. Webb	15
FAUNA of New Caledonia, Terrestrial Molluscan E. R. Sykes	71
Finn, A. H. Rev., Sinistral Shells and Superstition	29
HABITS of the Agnatha W. M. Webb	50
Habits of young <i>Sepia</i> F. A. Bather	33
Hedley, C., Mollusca of the Oriental Region	54
Hughes, Frank, Importation of Foreign land Molluscs ..	67
ILFORD brick-earth, <i>Succinea elegans</i> from W. M. Webb	30
Importation of foreign land Molluscs F. Hughes	67
Inter-breeding of Type and Variety of <i>Helix aspersa</i> .. G. T. Rope	30
JENNINGS, J., Shells and Superstition	67
KENNARD, A. S., New Pleistocene Mollusca from Crayford ..	29
LIMAX from Ireland, description of a new species of .. W. E. Collinge	4

	PAGES
MARSHALL, J. T., New British Marine Shells	33, 67
Mess-mate of <i>Limnata stagnalis</i>	G. Bailey 8
Mollusca, Notes on the less-known British Marine ..	G. W. Chaster 56
Mollusca of the Oriental Region.. ..	C. Hedley 53
Mollusca, Importation of foreign land	F. Hughes 67
NEW Caledonia, Notes on the Terrestrial Molluscan Fauna of	E. R. Sykes 71
Notes, Editors'	31, 52, 68, 86
OBITUARY	68
Oriental Region, Mollusca of the	C. Hedley 54
Oyster, Larval	51
Oyster, The di-myarian stage of the "Native" ..	W. M. Webb 15
Oysters as Disseminators of Disease	J. C. Thresh 1
PLEISTOCENE deposit containing shells at Chelmsford	W. M. Webb 30
Pleistocene Mollusca from Crayford	A. S. Kennard 29
<i>Plutonia</i> , Stabile, on the synonymy of	(BV) ² 29
Proceedings of Societies	31
<i>Purpura coronata</i> , Lam., in the West Indies ..	Rev. A. H. Cooke 69
RADULAE, Variations in	Rev. G. Bailey 52
Rope, G. T., Inter-breeding of Type and Variety of <i>Helix aspersa</i>	30
SCACCHIA <i>eddytonia</i> , Marshall, Note on	G. W. Chaster 73
<i>Scpia</i> , Habits of the Young	F. A. Bather 34
Shells, New British Marine	J. T. Marshall 35, 67
Shells and Superstitions	J. Jennings 67
Sinistral shells and superstition	Rev. A. H. Finn 29
Smith, E. A., Notes on the Generic Terms, <i>Cassidaria</i> and <i>Oniscia</i>	11
Snails, train stopped by	30
Societies, Proceedings of	31
Specie identity of <i>Papuna helix</i> , Smith, and <i>P. canfrana</i> ..	E. R. Sykes 51
<i>Succinea elegans</i> from the Ilford Brick-earth	W. M. Webb 30
Sykes, E. R., Terrestrial Molluscan Fauna of New Caledonia	71
Synonymy of <i>Plutonia</i> , Stabile, on the	(BV) ² 29
TESTACELLA, The British Species of	W. M. Webb 74
Thresh, J. C., Oysters as Disseminators of Disease ..	1
Toheroa and its enemies	S. Webb 67
Tryon's Manual (Review)	E. R. S. 42, 60
VARIATIONS in Radulae	G. Bailey 52
WEBB, S., Toheroa and its enemies	67
Webb, W. M., Di-myarian stage of the "Native" Oyster, 15. Habits of the Agnatha, 50. Pleistocene deposit containing shells at Chelmsford, 30. <i>Succinea elegans</i> from Ilford brick-earth, 30. The British species of <i>Testacella</i> , 74.	

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VOL. IV. (No. I.)

CONTENTS.

MARCH 30th, 1895.

	PAGE.
"Oysters as Disseminators of Disease," John C. Thresh, M.B., D.Sc., D.P.H.	1
"Description of a New Species of <i>Limax</i> from Ireland"	4
" <i>Amalia paryi</i> , a supposed New Species"	7
"A Mess-Mate of <i>Limnæa stagnalis</i> "	8
"Notes upon the Generic Terms <i>Cassidaria</i> and <i>Oniscia</i> " Edgar A. Smith, F.Z.S.	11
"The Di-Myarian Stage of the 'Native' Oyster" Wilfred Mark Webb, F.L.S.	15
Current Literature	19
On the Synonymy of <i>Plutonina</i> , <i>Stabile</i> (BV) ²	29
Sinistral Shells and Superstition A. H. Finn	29
NOTES—New Pleistocene Mollusca from Crayford A. S. Kennard	29
Pleistocene Mollusca at Chelmsford and Ilford W. M. W.	30
Inter-breeding of Type and Variety of <i>Helix aspersa</i> G. T. Rope	30
Proceedings of Societies	31
Editors' Notes	31

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VOL. IV. (No. 2.) CONTENTS. JUNE 29th, 1895.

							PAGE.		
The habits of the young <i>Sepia</i>		Francis A. Bather, M.A., F.G.S.			33		
New British Marine Shells		..	..	..	..	J. T. Marshall	35
Current Literature		..	..	..	..	..	39
REVIEWS	{	Cooke's Molluscs	W. M. W.	40	
		Tryon's Manual	E. R. S.	42
		Dall's Tertiary Fauna of Florida			W. E. C.	46
NOTES	{	Habits of the Agnatha	..	..	Wilfred Mark Webb, F.L.S.		50
		On the specific identity of <i>Papuina hedleyi</i> , and <i>P. canefriana</i>	E. R. Sykes, B.A., F.Z.S.		51	
		Variations in Radulae	George Bailey, F.R.M.S.		52		
Editors' Notes		52		

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VOL. IV. (No. 3.)

CONTENTS.

SEPTEMBER 30th, 1895.

								PAGE.	
"Mollusca of the Oriental Region"		Charles Hedley, F.L.S.				53	
"Notes on a few of the less-known British Marine Mollusca"		George W. Chaster, F.R.C.S.				56
Current Literature		..	..	..	..	..	..	60
REVIEW: Tryon's Manual		..	..	..	..	..	E. R. S.	60
NOTES	{	Shells and superstitions		..	..	..	J. Jennings	67
		Importation of foreign land molluscs		..	..	..	Frank Hughes	67
		The Toheroa and its enemies		Samuel Webb	67	
		New British marine shells		J. T. Marshall	67	
Editors' Notes		68	

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AND

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VOL. IV. (No. 4.) CONTENTS. DECEMBER 20th, 1895.

PAGE.

Title Page, Preface, and Contents of Volume IV.
" <i>Purpura coronata</i> , Lam., in the West Indies"	..	The Rev. A. H. Cooke, M.A.	69
"Notes on the Terrestrial Molluscan fauna of New Caledonia"	..	..	..
	..	E. Ruthven Sykes, B.A., F.Z.S.	71
"The British Species of <i>Testacella</i> " Part I.	..	Wilfred Mark Webb, F.L.S.	74
NOTES	{ Locality of <i>Clausilia recondita</i> , Sykes	..	..
	<i>Arion hortensis</i> , var. <i>caeruleus</i>	..	..
	On <i>Scacchia eddystonia</i> , Marshall	..	..
	..	Geo. W. Chaster, M.R.C.S.	73
Current Literature	..	..	..

REVIEWS	{ Taylor's Monograph, Part II.	..	..
	Godwin-Austen's Mollusca of Andaman and Nicobar Islands	..	..
	Pilsbry and Stearns' Marine Molluscs of Japan

Editors' Notes
List of Contributors to Volume IV.
Index to Volume IV.

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Review of Shipley and Reed's "Brachiopoda" in ditto				NOVEMBER, p. 353
Oceanic Deposits, Ancient and Modern, Part I., by W. F. Hume	OCTOBER, p. 270
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It will be our earnest endeavour to make the paper thoroughly representative, and the latter will be illustrated as heretofore.

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CONTENTS OF VOLUME V.

	PAGES
Some New Marine Mollusca from Tangier (Plate I.)	
G. W. Chaster, M.R.C.S.	1
Bibliography of Current Literature	
E. R. Sykes, B.A., F.Z.S., and S. Pace, F.Z.S.	
I. Classification and New Forms—	
A. Recent Forms	3, 21, 37, 60
B. Fossil Forms	8, 25, 40
II. Anatomy, Histology, Development & Physiology	9, 28, 41, 63
III. Biology, Habits and Teratology	11, 28, 43, 63
IV. Distribution and Fauna—	
A. Recent Forms	12, 28, 45, 64
B. Fossil Forms	14, 30, 47
V. Collecting and Methods of Research	15, 31, 50, 66
VI. Economics	16, 32, 51, 67
VII. Biographies	16, 32, 51, 68
Editor's Notes	16, 32, 67
On some Land Shells from New Guinea and other Neighbour- ing Islands (Plate II.)	Edgar A. Smith, F.Z.S. 17
Note on <i>Pterosoma plana</i> , Lesson	A. S. Kennard 32
On the Anatomy of <i>Chloritis (Sulcobasis) stiraphora</i> , E. A. Smith, and of <i>C. rehsei</i> , von Martens (Plate III.)	
William Moss and Wilfred Mark Webb, F.L.S.	33
Statement of the Committee of the British Association on Zoölogical Bibliography and Publication	36
<i>Corasia lauræ</i> , Gude (Note)	51
Reviews	5, 7, 10, 24, 27, 52, 53, 55
List of <i>Clausiliæ</i> of South America, with the description of a New Species (Plate IV.)	E. R. Sykes, B.A., F.Z.S. 57
Supposed New Varieties	Professor T. D. A. Cockerell, F.Z.S. 67
To Cook Snails	Florance Stephenson 67
Index to this Volume	69
List of Species, the Shells of which have been described or figured for the first time in this Volume	next page.

NEW SPECIES

DESCRIBED AND FIGURED IN VOLUME V.

			Page.	Plate.	Figure.
<i>Cocculum cuspidatum</i>	...	...	2	I.	(4)
<i>Retrotortina</i> (new genus) <i>fuscata</i>	...	...	2	I.	(5, 6)
<i>Pherusa carinata</i>	...	...	3	I.	(3)
<i>Cyclostrema pruinosum</i>	...	...	3	I.	(2)
<i>Cyclostrema fenestratum</i>	...	...	4	II.	(1)
<i>Charopa nigrofusca</i>	...	...	18	II.	(10, 11, 12)
<i>Macrochlamys papuana</i>	...	...	18	II.	(8, 9)
<i>Omphalotropis papuensis</i>	...	...	19	II.	(19)
<i>Pupinella strubelli</i>	...	...	21	II.	(13)
<i>Helicina pachystoma</i>	...	...	21	II.	(14)
<i>Clausilia evae</i>	...	...	58	IV.	(1, 2, 3)

FIGURED FOR THE FIRST TIME IN VOLUME V.

			Page.	Plate.	Figure.
<i>Nanina infelix</i>	...	...	17	II.	(6, 7)
<i>Papuina aérope</i>	...	...	17	II.	(1, 2)
<i>Papuina hero</i>	...	...	17	II.	(3, 4)

THE JOURNAL OF MALACOLOGY.

No. I.

MARCH 25th, 1896.

VOL. V.

SOME NEW MARINE MOLLUSCA FROM TANGIER.

By GEORGE W. CHASTER, M.R.C.S.

BEFORE proceeding to describe the shells referred to in the title of this paper, it may not be out of place to describe briefly how they came into my possession. About two years ago my friend Mr. H. Sidebottom, being engaged in the study of the Foraminifera, requested his relative, Mr. C. H. Nevill, of Bramall Hall, Cheshire, who was about to join a Mediterranean cruise, to bring back bags of anchor-mud and dredgings from the various places touched at. Other dredgings from the Adriatic and from a second cruise made last year were also obtained. These collections of material were with great readiness placed at my disposal to be examined for mollusca. Their range extends from Tangier to Smyrna, including many localities in the Mediterranean, Adriatic, Gulf of Corinth, and Aegean Sea. Although the quantity of material was comparatively small, the bags of dredgings weighing but a few pounds each, over two hundred species have been obtained therefrom. As might be expected these are almost all minute in size, there being hardly any measuring over half-an-inch. Amongst them, however, are many of considerable rarity and a few apparently new. To my friend the Marquis of Monterosato I must express my sincere thanks for the unfailing courtesy and readiness with which he has examined and identified the various forms, often after laborious search.

The material from Tangier consisted of a bag of dredgings from about seven fathoms, and a quantity of shore sand brought on board for the purpose of deck-scrubbing!

Amongst other noteworthy forms are *Rissoa parvula*, *R. fischeri* and *R. turricula* of Jefferys, *Marginella guancha*, d'Orb. *Rissoa (Alcidia) spinosa*, Monts., as well as the forms described below.

***Coecum cuspidatum* (Monts., MSS.), *sp. nov.*, Pl. I, Fig. 4.**

Shell comparatively long and slender, slightly curved, glossy, pellucid, sculptured with numerous but obscure lines of growth; the diameter increases very slightly and gradually towards the mouth; septum much produced in the form of a cone with slightly concave sides, ending in a fine point, and not deviating to either side; mouth not thickened by an annular rib. Length, 2.5 mm.

Several specimens of this species were found both in the dredgings and shore drift. One other species (undetermined) of the genus was met with.

Retrotortina*, *gen. nov.

Shell minute, coiled in a left-handed direction, spire depressed, mouth nearly circular, umbilicus large. The species for which I suggest this genus is interesting, representing as it does the sinistral (or probably far more correctly, pseudo-sinistral) form of a series of which *Skenea* and *Homalogyra* are respectively the dextral and planospiral members. The progressive diminution in size is also noteworthy, for *Retrotortina* is even more minute than *Homalogyra*.

***Retrotortina fuscata*, *sp. nov.*, Pl. I, Figs. 5 and 6.**

Shell minute, left handed, brown in colour, glossy, marked with numerous lines of growth; whorls, two, convex; suture, deep; spire nearly flat; mouth almost circular, somewhat oblique; umbilicus very large. Diameter, .5 mm.

A few specimens from shore drift. Unfortunately no live examples occurred, consequently until the operculum can be examined it must remain a matter of some slight uncertainty whether the shell is pseudo-sinistral or sinistral. The other members of the family found were *Skenea planorbis*, Fabr. and its var. *maculata*, Jeff., *S. pellucida*, Monts., and two species of *Homalogyra*.

***Pherusa carinata*, sp. nov., Pl. I., Fig. 3.**

Shell sub-cylindrical, rather thin, white, semi-transparent and glossy; sculpture consisting of very strong, sharp, spiral ridges of which there are four on the body whorl, three on the penultimate, and two on the second and third volutions, the nucleus being smooth and polished; of these ridges the uppermost is the strongest; whorls six, rather convex, shouldered above by the prominent keel; suture well defined, spire long; apex blunt and rounded; mouth somewhat oval, narrow above and dilated below; outer lip slightly angulated by the upper ridge, receding very much at its upper part, expanded below, the basal part being excavated by a wide shallow sinus; pillar lip somewhat oblique, reflected; umbilical chink narrow. Height, 1.8 mm. Breadth, .75 mm.

A single specimen from shore drift. The present species is interesting, affording as it does an example of a *Pherusa* with sculpture closely approximating to that so frequent in the typical *Aclis*. The characters of this species in other respects are those of the well-known *P. gulsonae*, Cl., which was also found in the same material. The only other member of the same family met with was the common species which Jefferys described as *Odostomia minima*, for which species and the closely-allied but quite distinct *Jeffreysia cylindrica*, Jeff., Monterosato proposes the sub-genus *Cima*, a separation with which I entirely concur.

***Cyclostrema pruinoseum*, sp. nov., Pl. I., Fig. 2.**

Shell sub-globose, whitish in colour, dull and frosted in appearance, owing to the entire surface being covered with very numerous, fine, close-set, flexuous striae following the direction of the lines of growth; on the umbilical area and adjoining part of the base there are also numerous, much stronger spiral lines, finely granulated by the striae just described; whorls two-and-a-half, convex; suture very distinct though not deep; spire but little raised; mouth nearly circular; outer lip thin, presenting two shallow sinuations, one at the periphery and one below; umbilicus rather large; operculum like that of *C. nitens*. Height, .85 mm. Breadth, .6 mm.

This species was very abundant in the dredgings, many of the specimens still containing the animal. The only species for which it could be well mistaken is *C. nitens*, Phil., from which it

differs in its smaller size, lustre-less and striated surface, basal as well as umbilical striae, and much larger umbilicus.

Cyclostrema fenestratum, *sp. nov.*, Pl. I., Fig. 1.

Shell globosely conical, rather solid, white: sculpture, numerous, slightly oblique, longitudinal, raised lines, of which there are about thirty on the body whorl, these are crossed by stronger spiral lines (six on the last half of the body whorl), of which the uppermost is some distance from the suture, and the lowest and strongest bounds the umbilical area: the intercrossing of these lines leaves squarish interspaces: whorls three, very convex, spire raised; suture deep; mouth circular (outer lip broken); umbilicus large, fluted by the closely crowded longitudinal lines. Height, .8 mm. Breadth 1 mm.

A single specimen dredged. This species occupies a position in some respects intermediate between *C. areolatum*, G. O. Sars, and *C. axillimum*, Phil., two forms at first sight very unlike. The former it approaches in shape, though the sculpture of the Tangier shell is much coarser. This surface decoration however in its characters very closely resembles that of *C. axillimum*, although it is finer, both the longitudinal and spiral lines being more numerous: the shell is, of course, very different in shape from Philippi's species. Another species described by Philippi, the fossil *Delphinula? elegantula* apparently differs only in having the longitudinal lines finer and closely crowded not giving rise to any decussation.

The *Cyclostromata* are well represented in the Tangier material, for, besides this species described, there occurred *C. nitens*, Phil., *C. cutlerianum*, Clark, *C. serpuloides*, Montg., *C. catenoides*, Monts., and *C. exilissimum*, Ph.

In conclusion, I must express my thanks to the courteous editor, Mr. Wilfred Mark Webb, for the care he has bestowed upon the accompanying plate.

SOUTHPORT, March 7th, 1896.

BIBLIOGRAPHY.*

The Bibliography has been undertaken by Mr. E. R. Sykes and Mr. S. Pace; the sections dealing with Systematic (and Recent Faunal) work being more especially controlled by Mr. Sykes, while Mr. Pace has paid special attention to the Anatomical and Palacontological Sections. Communications for these columns are welcomed from our readers, and will be gladly inserted if found suitable.

In this compilation an effort has been made, not so much to compete with publications of the nature of the Zoölogical Record, as to give our readers some general idea of the works and papers recently issued.

With a view to the saving of valuable space, the sections have been numbered, and cross references are denoted by the numbers only.

I. CLASSIFICATION AND NEW FORMS.

A. RECENT FORMS.

Ancey, C. F.—"On some new or hitherto little known Land Shells from New Guinea or adjacent Islands." *Proc. Linn. Soc. N.S.W.*, vol. x., part 2, pp. 374-381, pl. xxvi.

Bernard, F.—"On a new Lamellibranch (*Scioberebia australis*) commensal with an Echinoderm." *Ann. Mag. Nat. Hist.*, ser. 6, vol. xvii., pp. 109-110 (transl. from *C. R. Ac. Sci.*, cxxi., pp. 569-71).

Brot, A.—"Description de deux *Mélanies* nouvelles." *Journ. de Conch.*, vol. xlii., pp. 473-5, pl. ix, pars, Nov., 1895.

M. crawfordi from the Transvaal and *M. leefeii* from Tongatabu.

Chaster, George W.—"On the Variation of *Stilifer turtoni*, Brod." *Journ. of Conch.*, vol. viii., p. 176.

We fear that the varietal names will not prove of much service.

Dall, W. H.—"On some new species of *Scala*." *Naut.*, vol. ix., ppp. 111-2.

Dautzenberg, Ph.—"Révision des espèces actuellement connues du genre *Geotrochatella*." *Journ. de Conch.*, vol. xliii., pp. 19-26, pl. v., Feb., 1896.

Five species are chronicled of this East-Asiatic genus, of which two are newly distinguished.

Drouet, Henri.—"Unionidae nouveaux ou peu connus." *Journ. de Conch.*, vol. xliii., pp. 26-40, Feb., 1896.

Several new and unfigured species.

Fulton, Hugh.—"A list of the species of *Amphidromus*, Albers, with critical notes and descriptions of some hitherto undescribed species and varieties." *Ann. Mag. Nat. Hist.*, ser. 6, vol. xvii., pp. 66-94, pls. v.-vii., Jan., 1896.

*An asterisk denotes that the work has not been seen. The bibliography is carried up to March 1, 1896.

Generic reviews are the bricks of which the fabric of such works as the "Manual of Conchology" are constructed, and they are therefore always welcome. Mr. Fulton has done his work with great care and accuracy, though we could wish that some of the twelve varieties of *A. adamsi* were absent. We must confess to being unable to distinguish between the varieties *subunicolor* and *articulata*. Still, since we have been unable, after an examination of the paper, to discover an omitted recent species, we have to tender our thanks for a good piece of work, both as regards letterpress and plates. Might not, however, the word "recent" have occurred in the title, as we find no mention of such Tertiary species as *Bul. ellipticus*, Sow., which have been referred to this group?

Joubin, M. L.—"Céphalopodes recueillis dans l'estomac d'un Cachalot, capturé aux îles Açores." *Compt. Rend.*, vol. cxxi., no. 22, pp. 1172-4, fig.

Jousseau, Dr.—"Description de Coquille nouvelle." *Le Naturaliste*, ser. 2, no. 215, p. 43.

A new *Pusionella* from Aden.

Kobelt, Dr. W.—"Systematisches Conchylien-Cabinet." Band I., heft cxxix., lief 417, 1895 (contains *Helix*, pp. 795-802, pls. 219-224).

Kobelt, Dr. W.—"Systematisches Conchylien-Cabinet." Band I., heft cxxx., lief 418, 1895 (contains *Cerithium*, pp. 161-200, pls. 31-36).

Lahille, F.—"Contribucion al estudio de las Volutas Argentinas." *Revista del Mus. de la Plata*, vol. vi., pp. 295-332, 12 plates.

This, were it not for the very disproportionate amount of new varietal names, would be a most valuable paper. The plates illustrate the variation of the species exceedingly well, and show various stages of growth. The following species of Volutas are recorded from Argentina: *fusiformis*, Kiener; *colacynthis*, Chemn. = *brasiliensis*, auct.; *angulata*, Swainson; *ancilla*, Solander; *oviformis*, n. sp.; *tuberculata*, Wood; *magellanica*, Chemn.; *ambigua*, n. sp.; and *paradoxa*, n. sp.

Locard, A.—"A propos de l' *Helix variabilis*." *L' Ech., Rev. Linn., Ann.* xi., p. 98.

Locard, A.—"Une Physe Portugaise nouvelle." *L' Ech., Rev. Linn., Ann.* xi., p. 109.

Martens, E. von.—"Neue Land und Süsswasser Schnecken aus Ost-Afrika." *Nach. Mal. Ges.*, 1895, pp. 175-187.

Forty-two unfigured new species!

Martens, E. von.—"Mollusken von Paraguay." *SB. Ges. Naturf. Fr. Berlin*, 1895, pp. 33-5.

Martens, E. von.—"Verarbeitetes Conchylienstück aus Neuguinea." *SB. Ges. Naturf. Fr. Berlin*, 1895, pp. 35-8, fig.

Martens, E. von.—"Ostafrikanische Achatinen." *SB. Ges. Naturf. Fr. Berlin*, 1885, pp. 145-6.

Martens, E. von.—"Neue Arten von Landschnecken aus den gebirgen Ost-Afrika." *SB. Ges. Naturf. Fr. Berlin*, 1895, pp. 120-9.

New species of *Cyclophorus*, *Enna*, *Helicarion*, *Vitrina*?, *Trochonanina*, *Helix*, *Buliminus*, and *Sulolina*.

Martens, E. von.—"Neue *Buliminus* aus Sud-Arabien." *SB. Ges. Naturf. Fr. Berlin*, 1895, pp. 129-30.

Möllendorff, Dr. O. F.—"Pilsbry's neue Eintheilung der Heliciden." *Nach. Mal. Ges.*, 1895, pp. 169-175.

Pilsbry, H. A.—"Description of a new Australian *Chiton*." *Naut.*, vol. ix., p. 90.

Chiton bednalli, from South Australia.

Pilsbry, H. A.—“The earliest publication of *Dorcasia*, Gray.” Naut., vol. ix., p. 108.

Mr. Pilsbry points out that this group was first described in 1838, and not in 1845, as usually supposed.

Pilsbry, H. A.—“On the names of certain Subgenera of *Helicostyla*.” Naut., vol. ix., p. 108.

Dolichostyla and *Opallistyla* are proposed to replace *Prochilus* and *Eudoxus*, both of Albers and both preoccupied.

Pilsbry, H. A.—“The Aulacopoda: a primary division of the Monotremate Land Pulmonata.” Naut., vol. ix., pp. 109-111.

A character such as the presence or absence of the pedal groove seems, without further distinction, to be an insufficient ground on which to base the creation of a “super-family”; and we fear that the criticism which Mr. Pilsbry applies to those who have made use of the tail pore for the separation of families will be shortly applied to his use of the pedal groove.

Pilsbry, Henry A. “Sculpture of the apical whorls, a new character for distinguishing groups of *Bulimuli*.” Naut., vol. ix., pp. 112-5.

Naturalists are at last becoming aware of the extreme importance of the apical whorls in systematic work, as these are formed before external influences have their full power, and we congratulate the author on his use of the sculpture.

Pilsbry, H. A.—Manual of Conchology, ser. 1, part 62 (contains vol. xvi., pp. 49-112, pls. 17-31); ser. 2, part 38 (contains vol. x., pp. 49-96, pls. 16-25). Philadelphia, Nov., 1895.

The present part in the marine series is almost entirely occupied with a review of the genus usually known as *Aplysia*, but which Mr. Pilsbry replaces by *Tethys*, Linn., 1758 [non Linn. 1767, nec auctores sequentes]. The point on which this change turns, therefore, is whether the 10th or 12th Edition of Linné's work is to be the starting point, and general opinion now inclines to the 10th. It would seem to be a pity to have created a sub-family Aplysiinae, as the use of *Tethys* as a foundation for the name would be better. It must be confessed that to the general student this entire group fails to attract and has been much neglected, probably owing to the insignificant shell; we trust that this work may stimulate their study.

It is impossible to seriously criticise the work done in the land series—as indeed it is in almost all the parts—owing to the fact that one sees but a small portion of the work relating to the *Bulimi*, without possessing the key to the whole. Suffice it to say that this part concludes the study of *Thaumastus* and contains the commencement of the review of the family Bulimulidae. In this Mr. Pilsbry first considers the genus *Plekocheilus*, which he divides into *Plekocheilus* s. str., having a wrinkled or malleate surface and a smooth spire, and into *Eurytus*, in which the shell is generally granulate or striate. The first two pages of the genus *Auris*, Spix, conclude the part.

The following are new species in the marine series:—*Aglaja nuttalli* (p. 50), *Tethys panamensis* (p. 88), and *T. robertsi* (p. 99).

Pilsbry, H. A.—“Preliminary Outline of a New Classification of the Family Muricidae.” Amer. Natural., xxx., 69-71, 1896.

Quadras, J. F., and Moellendorff, O. F.—“Diagnoses specierum novarum ex insulis Philippinis.” Nach. Mal. Ges., 1896, pp. 1-15.

We decline to catalogue these supposed new species, all unfigured and but briefly described in Latin, with in general no comparisons. This habitual practice on the part of such distinguished authors is most strongly to be reprobated.

Rochebrune, Dr. A. S.—“Monographie des formes jusqu'ici connues, appartenant au genre *Ceratosoma*.” Nouv. Arch. du Mus., ser. 3, vol. vii., pp. 119-136, pl. vi.

- Roper, Edward W.—"Notes on the Washington *Sphaeria* and *Pisidia*, with descriptions of new species." Naut., vol. ix., pp. 97-9.
- Sowerby, G. B.—"Description of a new species of *Opisthostoma*." Ann. Mag. Nat. Hist., ser. 6, vol. xvii., p. 94.
O. linterae, from Sarawak.
- Stoll, A.—Zur Zoogeographie der landvewohnen Wirbellosen. Vierteljahrs. Naturf. Ges. Zurich, 1895, pp. 289-316, 2 pl.
Includes a discussion on the distribution of *Clausilia*.
- See also Crosse (IV. A), Nobre (IV. A), and Smith (IV. A).

B. FOSSIL FORMS.

Beushausen, L.—[See IV. B: "Lamell. rhein. Devon."]

The following new genera:—*Carydium*, *Conocardiopsis*, *Crassatellopsis*, *Opisthocelus*, *Prosochasma*; and *Prosoleptis* and *Tancrediopsis*, new sub-genera. Many new species.

Boettger, O.—"Neue Funde tertiärer Landschnecken bei Offenbach a. M." Nachrbl. Deutsch. malak. Ges., 1896, pp. 16-19.

Spiraxis ? *bickhardti*, n. sp.

Bonarelli, G.—"Il Gen. *Paroniceras*, Bonar. (1893)." Bull. Soc. mal. Ital., xix., pp. 225-38, pl. iv., 1895.

P. buckmani, n. sp.

C. (larke), J. M.—[Rev. of Wiman's paper on *Conularia* (Bull. geol. Upsala, 1895).] Amer. Geol., xvii., p. 119, 1896.

Fucini, A.—[See IV. B: "Fauna calc. M. Pisano."]

The following new species of Mollusca are described:—*Diotis pisana*, *Perna martini*, *Myoconcha etrusca*, *Cardita pseudotetragona*, *Neomegalodon etruscus*, *Cardium italicum*, *C. pisanum*, *Pleurotomaria stefanii*, *P. etrusca*, *P. anconai*, *Hamulina gemmellaroi*, *Scaevola pisana*, *Trochopsis ausonium*, *Trochus mario*, *T. nerii*, *T. fuchsi*, *T. zitteli*, *T. (Auseria, n. sg.) pseudonustus*, *T. (A.) acropterus*, *T. (A.) splendidissimus*, *Neritopsis bosniaskii*, *Holopella* ? *problematica*, *Natica futurum*, *Palaeoniso enzo*, *Chemnitzia pisana*, *C. etrusca*, *C. ugo*, *C. inops*, *C. julianensis*, *C. canavarii*, *C. achiardii*, *Microschiza sordida*, *Oonia suavis*, *Loxonema liasica*, *Zygopleura stefaniana*, *Z. acuta*, *Z. velata*, *Fibula juliana*, *Nautilus pisanus*, and *N. julianus*. The generic name *Juliana* is proposed for *Pustularia*, Koken (non Swains.).

Maas, G.—[See IV. B: "Die unt. Kreide. . ."]

The following new species of Mollusca are described:—(A) Neocomian: *Pleurotomaria subhercynica* (?), *Turbo reticularis*, *Trochus undulatus-striatus*, *T. ewaldi*, *Turritella striata* (?), *T. gersdorffensis*, *Cerithium pseudophillipsii*, *Corbula laevis*, *Tellina (Arcopagia) subhercynica*, *Psammobia carinata*, *Venus seveccensis*, *Crassatella subhercynica*, *Lucina subhercynica*, *Cardium ewaldi*, *Nucula ewaldi*, and *Cucullaea gersdorffensis*. (B) from the Gault: *Ancylloceras variabile*, *Panopaea zechi*, *P. subhercynica*, *P. carinata*, *P. ewaldi*, and *Trigonia roelligiana*. Most of the new forms are figured.

Mayer-Eymar, C.—"Descriptions de Coquilles fossiles des terrains tertiaires inférieurs (suite)." J. Conchyl., xliii., pp. 40-54, pls. ii-iv.

The following new species:—*Corbis bellardii*, *Turritella aegyptiaca*, *Mesalia hofana*, *M. oxyrepis*, *Fusus (Clavellites) spinosus*, *Tudicula aegyptiaca*, *T. umbilicaris*, *Turbinella frequens*, *Melongena nilotica*, *Pleurotoma ingens*, *Perciraea beyrichi*, and *Voluta (Volutolyria) arabica*.

Parona, C. F.—[See IV. B: "Fauna strati con *Posidonomya*."]

The following new species are described:—*Lytoceras meletense*, *Oppelia subtilicostata*, *Oecotraustes minor*, *Cadomoceras nepos*, *Sphaeroceras pilula*, *S. auritum*,

S. (?) disputabile, *Stephanoceras gibbum*, *S. rotula*, *S. venetum*, *Reineckia sansonii*, *Parkinsonia bonarellii*, *Morphoceras dimorphoide*, *Perisphinctes conclusus*, *P. torquis*, *P. perspicuus*, and *Limca (?) lata*. Other apparently new species are figured without name.

Regny, P. Vinassa de.—[See IV. B : "Moll. terz. Alpi venete."]

The following new species:—*Arca oppenheimi*, *Cardium postalense*, *Tellina bayaniana*, *Ampullina postalensis*, from Mte. Postale; *Arca recurvicosta*, *A. hilarionis*, *A. cobellii*, *A. ristorii*, *Hemicardium hilarionis*, *Cardita pachydonta*, *Crassatella (?) tricarinata*, *Tellina hilarionis*, *Pecten nicolosi*, *P. bonarellii*, *Spondylus (?) sesquispinatus*, *Ostrea hystrix*, *Patella gregorioi*, *P. pyramidalis*, Mgh. Mss., *P. stygis*, Mgh. Mss., *Turbo fucinii*, *T. greci*, *T. (?) d'achiardii*, *Nerita canavarii*, *Niso fallax*, *Adeorbis acuticosta*, Mgh. Mss., *A. septemcarinata*, *Xenophora splendida*, *Hipponyx flexuosus*, *H. striatus*, Mgh. Mss., *H. corrugatus*, Mgh. Mss., *H. spinelli*, Mgh. Mss., *Bayania (?) nuda*, Mgh. Mss., *Turritella catanii*, *T. (?) babylonica*, *Mesalia disputata*, *Ovula globosa*, *Erato ritae*, *Pyrula gradata*, *Ficula spinelli*, Mgh. Mss., *F. elongata*, *Oliva palladioi*, Mgh. Mss., *Cancellaria margaritata*, *Pleurotoma sinuodulosa*, *P. marinellii*, *Raphitoma biserialis*, Mgh. Mss., *Bulla spinellii*, Zitt. Mss., and *Helix moduloides*, Mgh. Mss.

Tiessen, E.—[See IV. B : "Subhercyne Tourtia."]

The following new species of Mollusca:—*Janira johannis-boehmi*, *Pleurotomaria tourtia*, *P. ewaldi*, *P. longimontana*, *Solarium ornato-dentatum*, *S. bicarinatum*, *Turbo tricinctus*, *T. impar*, *T. pseudocarinatus*, *T. subhercynicus*, *Trochus tourtia*, and *Turritiles jacheli*.

Tommasi, A.—[See IV. B : "Fauna Trias inf."]

The following new Molluscs:—*Pecten (Chlamys ?) tellinii*, *Avicula taramelli*, *Posidonomya haueri*, *Gervillia meneghinii*, *Mytilus anonymus*, *Anoplophora stellai*, *Psammococha servini*, and *Pleurotomaria (Cryptoenia) sansonii*. Other supposed new species are also figured without name.

Vincent, E.—"Contribution a la paléontologie de l'éocène belge. Note préliminaire sur *Crassatella*." Pr. Verb. Soc. mal. Belg., 1895, pp. clx.-xx.

The following new species:—*C. (Pseuderiphyla) cossmanni*, *C. (Ps.) erratica*, and *C. (Ps.) wemmelensis*, G. Vine. Mss.

Weissermel, W.—"Beitrag zur Kenntniss der Gattung *Quenstedticeras*." Zeitschr. Deutsch. geol. Ges., xlvii., pp. 307-30, pls. x.-xii., figs., 1895.

Woods, H.—"The Mollusca of the Chalk Rock : Part I." Quart. J. Geol. Soc., lii., pp. 68-98, pls. ii.-iv. Bibl., Tables.

The following new species:—*Ptychoceras smithi*, *Trochus schlüteri*, *T. berocscirensis*, *Turbo geinitzi*, *Cerithium cuckhamshiense*, *C. saundersi*, and *Dentalium turoniense*.

See also Matthew (IV. B), and Oppenheim (IV. B).

II. ANATOMY, HISTOLOGY, DEVELOPMENT AND PHYSIOLOGY.

—"The Aptychus." Nat. Sci., viii., p. 84, Feb., 1896.

Notice of Dr. R. Michael's discovery of a specimen of *Oppelia steraspis* having in its interior some 60 young shells, each of which, as well as the adult, is closed by an aptychus (Zeitsch. Deutsch. geol. Ges., xlvii., pp. 697-702, pl. liv.).

Amadrut, A.—"Etude comparative de la masse buccale chez les Gastéropodes et particulièrement chez les Prosobranches diotocardes." C. R. Ac. Sci., cxxi., pp. 1170-2.

*Babor, J. F.—"Über das Centralnervensystem von *Dreissensia polymorpha*." S. B. böhmisch Ges., xlviii.

- Bernard, F.—"Sur quelques stades du développement du *Scioberetia australis*, Nob., Lamellibranche à Coquille interne." Bull. Mus. Paris, i., pp. 275-7, fig., 1895.
- Boutan, L.—"Recherches sur le Byssus des Lamellibranches." Arch. Zoöl. exp., s. 3, vol. iii., pp. 297-338, pls. xiii.-xiv, 3 figs., 1895.
- Carazzi, D.—"Fagocitosi e diapede i nei lamellibranchi." Monit. Zoöl. Ital., vi., pp. 249-56, 1895.
- Dall, W. H.—"New Data on *Spirula*" [Rev. of Huxley and Pelseneer's "Challenger" Report]. Science, N.S., vol. iii., pp. 243-6.
- Dr. Dall, in this very valuable critical note, suggests from a study of a nearly perfect specimen in the U.S. National Museum, that *Spirula*, "while not unable to swim, is in general sedentary," living attached by an aboral sucker to stones, &c., in abyssal depths; and that the exposure of the shell in the Challenger and some other specimens, instead of being normal, as Pelseneer states, is really the result of the forcible pulling away of the *Spirula* from its perch by predacious deep-sea fish.
- Garstang, W.—"The Chromatophores of Animals." Sci. Prog., iv., pp. 104-31, Bibl., 1895.
- Haller, B.—[Rev. of Pelseneer's "L'hermaphroditisme chez les Mollusques" (Arch. Biol., xiv., 33)]. Zoöl. Centralbl., ii., pp. 776-7, 1895.
- Haller, B.—"Beiträge zur Kenntniss der Morphologie von *Nautilus pompilius*" (Zoöl. Forschungsreisen in Australien, &c., vol. v.). Denk. Ges. Jena, vol. viii., 18 pp., 2 pls., 2 figs.
- Jacobi, A.—"Anatomische Untersuchungen an malayischen Landschnecken (*Amphidromus chloris* und *Amphidromus interruptus*." Arch. Naturg., lxi., pp. 293-318, pl. xiv., Bibl., 1895 (1896).
- Joubin, L.—[See I. A: "Cephalop. rec. dans l'estom. d'un Cachalot."]
- Among the remarkable forms obtained, especial attention may be called to *Lepidoteuthis grimaldi*, n. sp., the tail of which is covered with large rhombohedral scales reminding one of those of some ganoid fishes.
- Kopsch, F.—"Das Augenganglion der Cephalopoden." Anat. Anz., vol. xi., pp. 361-9, 3 figs.
- Korschelt, E.—[Rev. of Schmidt on Development of Stylommatophora (Zoöl. Jahrb. Anat., viii.)]. Zoöl. Centralbl., ii., pp. 778-81, 1895.
- Korschelt, E.—[Rev. of Sigerfoos' paper on Development of Pholadidae (Johns Hopk. Univ. Circ., no. 119.)]. Zoöl. Centralbl., iii., pp. 18-9, 1896.
- Korschelt, E.—[Rev. of Erlanger's "Etudes dév. Gastrop. pulm." (Arch. Biol., xiv., pp. 127-).]. Zoöl. Centralbl., iii., p. 116, 1896.
- Korschelt, E.—[Rev. of Erlanger's paper on the Origin of the Mesoderm in *Paludina* (Morphol. Jahrb. 22.)]. Zoöl. Centralbl., ii., pp. 777-8, 1895.
- Newbigin, M. J.—"The Pigments of Animals." Nat. Sci., viii., pp. 94-100, Feb., 1896.
- Pelseneer, P.—"Prosobranches aériens et Pulmonés branchifères." Arch. Biol., xiv., pp. 351-93, pls. xiv.-xviii., 1895.
- Plate, L. H.—"Bemerkungen über die Phylogenie und die Entstehung der Asymmetrie der Mollusken." Zoöl. Jahrb. Anat., ix., pp. 162-206, 19 figs., Bibl.
- Ruprecht, R.—"Physiologische Untersuchungen an *Eledone moschata*." Zeitschr. Naturw., vol. 68, pp. 280-4, 1 fig., 1895.
- Review of paper by O. Uexküll in Zeitschr. Biol.
- Simroth, H.—[Abstract of "Die Gastropoden der Plankton-Expedition" (see Bibl. in No. 4.)]. Zoöl. Centralbl., iii., pp. 19-29, 1896.

Simroth, H.—"Ueber die einfachen Farben im Tierreich." Biol. Centralbl., xvi., pp. 33-51, 1896.

Sterki, Dr. V.—"Some Notes on the Genital Organs of Unionidae, with Reference to Systematics." Nautilus, ix., pp. 91-4, 1895.

Thiele, J.—"Ueber die Verwandtschaftsbeziehungen der Amphineuren." Biol. Centralbl., xv., pp. 859-69, Bibl., 1895.

Maintains that the *Solenogastres* are not Mollusca and must be separated from the Chitons.

Vayssière, A.—"Etude zoologique de l'*Ovula (Neosimnia) spelta*, L., et du *Conus mediterraneus*, Bruguière." J. Conchyl., xliii., pp. 5-18, pl. i.

Vernon, H. M.—"The Respiratory Exchange of the Lower Marine Invertebrates." J. Physiol., xix., 18-70, 13 figs.

The following Mollusca were experimented upon:—*Tethys*, *Pterotrachea*, *Cymbulea*, and *Octopus*.

III. BIOLOGY, HABITS AND TERATOLOGY.

Bernard, F.—"On a new Lamellibranch (*Scioberetia australis*) commensal with an Echinoderm." Ann. Nat. Hist., s. 6, xvii., pp. 109-10 (transl. from C. R. Ac. Sci., cxxi., pp. 569-71).

Bouvier, E. L.—"Le Commensalisme chez certains Polypes madréporaires." Ann. Sci. nat., s. 7, vol. xx.

Note (pp. 23-30) on the commensalism of *Kellia deshayesi* with *Heteropsammia* and the associated *Aspidosiphon*.

Boycott, A. E.—"On Shell-Coloration in British Extra-Marine Mollusca." Zoölogist, s. 3, xx., pp. 62-70, 1896.

Cockerell, T. D. A.—"Sinistral *Patula strigosa*." Naut., vol. ix., p. 108.

Crowther, H.—"Protective resemblance of shell of *Helix cantiana*, Mont., to its surroundings." J. Conch., viii., p. 161, 1896.

Hartlaub, C.—"Die Polypen und Quallen von *Stauridium productum*, Wright, und *Perigonopus repens*, Wright." Zeitschr. Wiss. Zool., vol. lxi., pp. 142-62, pls. vii.-ix., Dec., 1895.

Association of the Hydrazoon *P. repens* with *Nucula nucleus* at Heligoland.

Keyes, C. R.—"A gigantic Orthoceratite from the American Carboniferous." Science (n.s.), iii., pp. 94-5.

Specimen of *O. fanslerensis* probably over 6 ft. long.

Lancelevée, Th.—"Sinistrosité de l' *Helix pomatia*." Bull. Soc. Sci. Nat., d' Elbeuf, Ann. 1894, p. 13.

Packard, A. S.—[Rev. of Kew's "Dispersal of Shells" (Int. Sci. Series, London, 1893).] Science (n.s.), iii., pp. 207-8, 1896.

In this somewhat belated review Packard calls attention to two cases omitted by Kew—(a) the introduction into North America of *H. hortensis*, (b) the extreme and rapid variation of *H. nemoralis* in Lexington, Va., since its comparatively recent introduction.

Post, E. J.—"Plover caught by a *Pinna*." Naut., vol. ix., p. 107.

Strode, W. S.—"The size of Mussels." Naut., vol. ix., pp. 115-6.

Wetherby, A. G.—"New Records of reversed American *Helices*." Naut., vol. ix., p. 94.

Wright, C. E.—"*Helix hortensis*, Monst., *sinistrorsum* in Northamptonshire." Journ. of Conch., vol. viii., p. 151.

IV. DISTRIBUTION AND FAUNA.

A. RECENT FORMS.

- Adams, Lionel E.—“*Physa acuta* at Ostend.” Journ. of Conch., vol. viii., p. 176.
- Andrews, Mrs. Geo.—“Shells of Thunderhead Mt., N.C.” Naut., vol. ix., p. 120.
- [Bowell, E. W. W., and Bazely, E. H.]—“British Land and Freshwater Shells, Part III.” Devonian, vol. i., part iii., pp. 64-73, figs.
- Byne, L. St. George.—“The Marine Mollusca of Teignmouth Bay: Additions.” Journ. of Conch., vol. viii., pp. 162-7.
- Caziot.—“Faune Malacologique terrestre et fluviatile du departement de la Vienne.” Feu. Jeun. Nat., ser. 3, no. 303, pp. 54-5.
- Clapp, Geo. H.—“*Vitrina limpida* in Western Pennsylvania.” Naut., vol. ix., pp. 94-5.
- Cockerell, T. D. A.—“California Slugs.” Naut., vol. ix., p. 120.
- Crosse, H.—“Faune Malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances (suite et fin).” Journ. de Conch., vol. xlii., pp. 333-473, pl. ix.-x., Nov., 1895.
- This completes the important study by Mr. Crosse of the New Caledonian Fauna. He describes a shell, previously considered to be a variety of *Helicina porphyrestoma*, under the name of *H. rossiteri*. Also *Helix pomatia* is recorded as an acclimatised species; this must, however, be a slip for *H. aspersa*, since the authorities he quotes refer to this latter species only. The entire land and freshwater fauna is said to comprise 361 species—an enormous number considering the extent of the islands. A table of the geographical distribution of the species amongst the islands concludes this very instructive paper.
- Dautzenberg, Ph. “Campagne de la Melita, 1892. Mollusques recueillis sur les cotes de la Tunisie et de l’Algerie.” Mem. Soc. Zoöl. France, vol. viii., pp. 363-73.
- Farrer, Capt. J. W.—“Notes on the Land and Freshwater Mollusca of the English Lake District.” Journ. of Conch., vol. viii., pp. 151-161.
- Fra Piero (Pietro Arbanasich).—“La Enumerazione dei Molluschi della Sardegna.” Boll. Soc. Mal. Ital., vol. xix., pp. 263-78.
- Deals with the Cephalopods and Pteropods.
- Gardner, A. H.—“Dredging in Long Island Sound.” Naut., vol. ix., pp. 119-120.
- Hedley, C.—“Considerations on the Surviving Refugees in Austral Lands of Ancient Antarctic Life.” Ann. Nat. Hist., s. 6, vol. xvii., pp. 113-20.
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Contains the Cephalopods, Pteropods and the commencement of the Gastropods.

Oldham, Chas.—“*Limax cinereo-niger* in Cheshire.” *Journ. of Conch.*, vol. viii., p. 151.

Oldham, Chas.—“*Agriolimax agrestis* v. *albida*, Picard, in Cheshire.” *Journ. of Conch.*, vol. viii., p. 151.

P[ilsbry], H. A.—“*Lepidopleurus* in New Zealand.” *Naut.*, vol. ix., p. 108.

Pruvot, G.—“Coup d'oeil sur la Distribution Générale des Invertébrés dans la Région de Banyuls (Golfe du Lyon).” *Arch. Zoöl. exp.*, s. 3, vol. iii., pp. 629-58, 1895.

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M. Raeymaekers concludes that the species is extinct in the brackish waters of Belgium.

Randolph, P. B.—“Shells of Seattle, King Co., Washington.” *Naut.*, vol. ix., pp. 101-2.

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Scott, Thomas.—“*Xylophaga dorsalis* in the Firth of Forth.” *Ann. Scott. Nat. Hist.*, no. 17, Jan., 1896, p. 63.

Smith, Edgar A.—“Notes on some Land Shells from Vanbu, Tonkin, with descriptions of two new species.” *Ann. Mag. Nat. Hist.*, ser. 6, vol. xvii., pp. 128-130, Feb., 1896.

A new *Camaena* and *Pterocyclus*.

Sterki, Dr. V.—“Small land Mollusca from New Mexico.” *Naut.*, vol. ix., p. 116.

Suter, H.—“Corrections et Additions à la Liste synonymique et bibliographique des Mollusques terrestres et fluviatiles de la Nouvelle-Zélande.” *Journ. de Conch.*, vol. xlii., pp. 476-7.

Taylor, Rev. G. W.—“Preliminary Catalogue of the Marine Mollusca of the Pacific Coast of Canada, with notes upon their distribution.” *Trans. Roy. Soc. Canada*, ser. 2, vol. i., pp. 17-100.

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those in these islands is that the nomenclature has not been burdened with a mass of names for indistinguishable varieties. May it long remain so!

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White, Mrs. G. W.—"Collecting in Southern California." Naut., vol. ix., pp. 102-4.

———"The Marine Zoölogy, Botany and Geology of the Irish Sea: Third Report of the Committee." Rep. Brit. Assoc., 1895, pp. 455-67.

See also Ancey (I. A), Gregorio (IV. B), Lahille (I. A), Martens (I. A), Packard (III.), Quadras (I. A), and Roper (I. A).

B. FOSSIL FORMS.

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Browne, M.—"Preliminary Notice of an Exposure of Rhaetic Beds, near East Leake, Nottinghamshire" (Fourth Contribution to Rhaetic Geology). Rep. Brit. Ass., 1895, pp. 688-90.

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List of fossils.

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Dollfus, G. F.—"Probable Extension of the Seas during Upper Tertiary Times in Western Europe." Rep. Brit. Ass., 1895, pp. 690-1.

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Foresti, L.—"Enumerazione dei Brachiopodi e dei Molluschi pliocenici dei dintorni di Bologna." Bull. Soc. malac. Ital., xix., 240-62, 1895.

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(See I. B.)

Gregorio, A. de.—"Terza nota su talune Conchiglie Mediterranee viventi e fossili." Natural. Sicil., xiv., pp. 236-43, 1895.

Gregorio, A. de.—"Appunti su talune conchiglie estramarine di Sicilia viventi e fossili, con la spiegazione delle tavole dell' opera di Benoit." Natural. Sicil., xiv., 183-212, 1895.

Harmer, F. W.—"On the Derivative Shells of the Red Crag." Rep. Brit. Ass., 1895, pp. 676-7.

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- Mieg, M.**—"Excursions géologiques en Alsace." *Feuille Natural.*, s. 3, xxvi., pp. 23-5, 68-74, Map, *Bibl.*, 1896.
- Miller, A. M.**—"The Association of the Gasteropod Genus *Cyclora* with Phosphate of Lime Deposits." *Amer. Geol.*, xvii., pp. 74-6, 1896.
- Newton, R. B.**—"On the Occurrence of *Alectryona unguolata* in S.E. Africa; with a notice of previous researches on the Cretaceous Conchology of Southern Africa." *J. Conch.*, viii., pp. 136-51, 1896.
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A preliminary list containing some new names.
- Tiessen, E.**—"Die subhercynen Tourtia und ihre Brachiopoden-und Mollusken-Fauna." *Zeitschr. Deutsch. geol. Ges.*, xlvii., pp. 423-533, pls. xvii.-xviii., figs., *Bibl.*, 1895.
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See also **Abbott (VI.)**, **Boettger (I. B.)**, **Hedley (IV. A.)**, and **Vincent (I. B.)**.

V. COLLECTING AND METHODS OF RESEARCH.

- *Bavay.**—"Conservation et préparation des Mollusques." *Feuille Natural.* (3), xxvi., pp. 44-7, 1896.

- Borgert, A.—"Ein einfaches Netz zum Fischen von Plankton bei schneller Fahrt." *Zeitschr. Wiss. Mikr.*, xii., pp. 307-11, 2 figs., 1896.
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- Sorby, H. C.—(Mounting marine organisms as lantern slides.) *J. R. Micr. Soc.*, 1896, pp. 136-40.

VI. ECONOMICS.

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EDITOR'S NOTES.

Our readers will learn with regret that Mr. Walter E. Collinge, F.Z.S., who founded the "Journal of Malacology" in 1890, has been obliged to retire from the co-editorship, in consequence of pressure of work.

We regret to record the death of Mr. J. Bracebridge Wilson, an enthusiastic and most successful collector of forms of marine life, especially those of the Colony of Victoria. He passed away on Oct. 22nd, 1895, at the age of 67.

There is in our contemporary, the "Naturalist's Journal" for February, a record of a colony of *Helicella cantiana*, introduced from Hampshire to South Staffordshire eight years ago, and still surviving.

We are pleased to bring before our readers the analytical card catalogue of current zoölogical literature, a special edition of the "Bibliographica Zoölogica," which in turn is a continuation of the "Zoölogische Anzeiger." Professor Carus will continue to be editor-in-chief. The annual subscription to the Molluscan part is 12s., which should be sent to the Bibliographical Bureau, Zurich-Oberstrass (Switzerland).

In Volume IV., p. 81, attention might have been called to the anatomical work contained in Dr. Dall's paper, which is of some considerable importance.

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VOL. V.

ON SOME LAND SHELLS FROM NEW
GUINEA AND OTHER NEIGHBOURING
ISLANDS, WITH DESCRIPTIONS OF NEW
SPECIES.

By EDGAR A. SMITH, F.Z.S.

(Assistant-Keeper of Zoology, British Museum).

(PLATE II.)

The majority of the species referred to or described in this paper were collected in British New Guinea, in the region lying to the north of Orangerie Bay, by Mr. Anthony, Collector to the Hon. Walter Rothschild. The collection contained a large series of *Nanina hunsteini*, *Chloritis* (*Sulcobasis*) *strophora*, *Leptopoma vitreum*, *Succinea strubelli*, and *Papuina brumeriensis*, in addition to the species hereafter mentioned. The new *Pupinella* from Djamna Island, and the *Helicina* from Neu Pommern (New Britain), have been placed in my hands for description by Herr Bruno Strubell, and the new *Charopa* from German New Guinea, and the two *Truncatellae* from Samarai at the eastern extremity of the Island, were submitted to me by Mr. Hugh Fulton.

I take this opportunity of figuring four species described by me a few years ago, three of which have not as yet been illustrated. They are as follows:—1. *Nanina infelix** (Figs. 6, 7); 2. *Papuina acrope*† (Figs. 1, 2); 3. *P. hero*.† (Figs. 3, 4); 4. *P. janthe*† (Fig. 5). (Pilsbry, Man. Conch., series 2, vol. ix., pl. 46, figs. 17-19.)

* The Conchologist, vol. ii., p. 109.

† Ann. Mag. Nat. Hist., 1891, vol. vii., pp. 451-452.

1. *Microcystina sappho*, Brazier.

Helix (Thalassia) sappho, Brazier, Proc. Linn. Soc., N. S. Wales, 1876, vol. i., pp. 100 and 119; Canefri, Ann. Mus. Gen., vol. xix., p. 95 (*Thalassia*); Hedley, P. Linn. Soc., N. S. W., 1891, vol. vi., p. 75, pl. ix., f. 7.
 Hab.: Yule Island (Brazier); Maiva and Mission Hill (Hedley).

Var. *mailuensis*.

This form differs from the type in being more highly glossy, and in having the spire slightly more elevated.

An examination of a series of specimens of the typical form from Maiva, kindly sent to the Museum by Mr. C. Hedley, shows that the surface is microscopically striated, spirally, both above and beneath. In the shells from Mailu, however, this microscopic striation does not appear to be present, the surface in consequence being more polished.

A few examples of the normal form were also obtained at Mailu.

In the variety, the tongue-like reflexion of the columella is very strongly developed.

2. *Charopa nigrofusca*, n. sp. (Pl. II., Figs. 10-12).

Testa depressa, orbicularis, late et aperte umbilicata, saturate fusca, liris tenuissimis confertis flexuosis obliquis ornata; spira depressa, supra anfract. ultimum vix elata; anfractus $4\frac{1}{2}$ rotundati, regulariter accrescentes, sutura profunda sejuncti, primus laevis, caeteri costulati, ultimus ad peripheriam acute rotundatus, haud descendens; umbilicus latus, perspectivus, diam. totius $\frac{1}{3}$ adaequans; apertura latissime lunata, concolor; peristoma tenue, margine columeliari haud reflexo.

Diam. maj. 6 millim., min. 5, alt. $2\frac{2}{3}$.

Hab.: German New Guinea.

3. *Macrochlamys papuana*, n. sp. (Pl. II., Figs. 8, 9).

Testa orbicularis, depressa, anguste perforata, rubello-cornea, nitida, striis incrementi tenuissimis sculpta; spira parum elata, ad apicem obtusa; anfractus $5\frac{1}{2}$ convexiusculi, lente accrescentes, infra suturam impresso-marginati, ultimus ad peripheriam obso-

lete vel obtusissime angulatus, prope aperturam vix descendens ; apertura obliqua, lunata ; peristoma tenue, supra umbilicum anguste expansum et concave reflexum.

Diam. maj. 16 millim., min. $13\frac{1}{2}$, alt. 8.

In addition to the fine lines of growth, indications of spiral striae are observable under a strong lens.

4. *Rhysota hercules*, Hedley.

Oxytes hercules, Hedley, Proc. Linn. Soc., New S. Wales, 1891, vol. vi., p. 70, pl. ix., figs. 1, 2 : Smith, Conchologist, vol. ii., p. 108.

Var. = *O. flyensis*, Hedley, l.c. p. 71, pl. ix., figs. 3, 4 ; vol. ix., p. 390, pl. xxv., figs. 16 and 17 (jaw and radula).

Hab. : Fly River (Hedley).

I cannot agree with Mr. Hedley in separating the form *flyensis* as a distinct species. The slightly more elevated spire of the type does not prove a constant character, judging by the series of specimens I have examined. Both forms have a pink peristome, the sculpture is practically the same, and the periostracum is similar. The chief distinction consists in the difference of the ground colour. In *hercules* it is livid purple on the underside, generally darker towards the circumference than near the centre ; whereas in *flyensis* it is white with a broad blackish marginal zone. The colour of the upper surface in *fresh* specimens (Mr. Hedley's were "dead shells") of *flyensis* is like that of *hercules*. Two specimens of the former in the Museum have the peristome of a very dark rich brown, becoming pinkish in the umbilical region.

5. *Omphalotropis papuensis*, n. sp. (Pl. II., Fig. 19).

Testa parva, anguste umbilicata, ovato-conica, pallide vel rufescente cornea, subnitens ; spira conica, ad apicem subacuta ; anfractus $5-5\frac{1}{2}$ convexi, regulariter accrescentes, sutura profunda sejuncti, lineis incrementi obliquis tenuissimis striati, ultimus ad peripheriam lira filiforme cinctus, infra convexus, circa umbilicum angustum rotundatus, haud angulatus ; apertura rotundata, sed superne paulo acuminata ; peristoma simplex, marginibus callo tenui junctis, columellari rufescente, leviter incrassato et reflexo.

Longit. 4 millim., diam. 3. Apertura 2 longa, $1\frac{1}{2}$ lata.

This species is allied to *O. brazieri* and *O. protracta* of Hedley. From the former it appears to differ in the more conical form of the spire, in the rounded base of the last volution, the absence of an angle around the umbilicus, and the simple peristome. It is apparently more narrowly perforate than *protracta*, has fewer whorls, although of larger dimensions, and the last has at the middle a distinct thread-like keel, which is continued a short distance up the spire just above the suture. It is not "angled at the margin" of the umbilicus.

6. **Cyclotus horridus**, Hedley (Pl. II., Figs. 16-18).

Cyclotus horridus, Hedley, Proc. Linn. Soc., N. S. Wales, 1891, vol. vi., p. 100, pl. xii bis, f. 49.

Hab.: Milne Bay, Mita and South Shore (Hedley).

Two specimens in the present collection, much larger than the types described by Mr. Hedley, may belong to this species. They are 16-17 millim. in their greatest diameter. The spiral striae and the bristly periostracum appear to be similar, excepting that here and there some of the former are a little coarser than the rest, one at the periphery forming a slight median carination.

7. **Truncatella quadrasi**, Möllendorff.

Truncatella quadrasi, Möllendorff, Bericht Senckenberg. nat. Gesell., 1893, p. 137, pl. v., f. 10-10 b.

Hab.: Leyte and Sibuyan, Philippine Islands (Möll.).

The specimens from Samarai, British New Guinea, agree exactly with the description and figure of this species, and as the distribution of the various forms belonging to the genus is known to be very wide in many instances, there is no reason why this well-marked form should not be found both at the Philippines and New Guinea.

8. **Truncatella valida**, Pfeiffer.*

A slender form (*T. teres*) of this widely-distributed species was also met with at Samarai, as well as a second variety in which the riblets are developed only just below the suture. This form was described by Pfeiffer under the name of *T. ceylanica*.†

* Conch.-Cab., ed. 2, p. 11, pl. ii., figs. 19-21.

† Mon. Auricul., p. 187.

The specimens vary in size, some being more slender than others, and intermediate degrees of costation are also occasionally met with. When the genus is re-monographed, it is probable that some older name will be discovered to replace that of *valida*.

9. *Pupinella strubelli*, n. sp. (Pl. II., Fig. 13).

Testa imperforata, oblongo-ovata, superne acuminata, dilute fusco-cornea, haud nitida, lineis incrementi tenuibus obliquis striata; anfractus 6, superiores quinque convexi, ultimus minus convexus, obliquus, antice paulo descendens, supra aperturam leviter planatus, ad basin pone fissuram columellarem cristatus; apertura subcircularis, pallide flavescens vel sordide albida; peristoma expansum, reflexum, incrassatum, dilute flavescens fissura columellaris parva, angusta; labrum ad insertionem leviter canaliculatum.

Longit. 11 millim., diam. 6; apertura intus 3.

Hab.: Djamna Island, Dutch New Guinea, off north coast.

A specimen of this species has been presented to the British Museum by Herr Bruno Strubell, after whom I have named it. *P. fultoni*, Smith, 1895 (= *P. luteola*, Brancsik*), is a closely-allied form, but a little larger, having a deeper columellar slit, but lacking the basal crest which occurs in the present species. *C. strubelli*, through the obliquity of the body-whorl, has a somewhat distorted look, like certain forms of *Streptaxis*. The columellar callus extends in a curve towards the termination of the outer lip, with which it forms a slight canaliculation. Herr Strubell informs me that Djamna or Djammna Island is situated off the north coast of the island.

10. *Helicina pachystoma*, n. sp. (Pl. II., Fig. 14).

Testa turbinata, solida, flava; spira conica, ad apicem subacuta; anfractus 5 leviter convexiusculi, oblique tenuiter striatuli, ultimus postice rotunde subangulatus, antice infra angulum descendens; apertura intus flavescens; peristoma expansum, valde incrassatum, albo-pellucidum; callus basalis mediocris, flavescens, circumscriptus.

Diam. maj. 8 millim., min. $6\frac{1}{2}$, alt. 7.

Hab.: Neu Pommern (= New Britain).

* Jahresheft naturwis. Vereines Trenesin Comit, 1894-5, xvii.-xviii. (1896), p. 225, pl. v., f. 7a, 7b.

This solid species is well characterised by the much-thickened and produced pellucid labrum. Two specimens have been presented to the British Museum by Herr Strubell.

11. *Helicina solitaria*, Smith (Pl. II., Fig. 15).

Helicina solitaria, Smith, Ann. Mag. Nat. Hist., 1887, vol. xix., p. 425, pl. xv., f. 10 (not good!).

Hab.: Eafa district, between Mounts Alexander and Bellamy, at an elevation of from 5,000 to 6,000 feet.

Several fresh specimens show that the colour is somewhat variable. The general ground-colour is opaque-white, sometimes varied with a spiral purple-red zone upon the middle of the upper surface of the whorls, or with some irregular spots or dots of the same colour. The apex is generally opaque pale yellow, and the two succeeding whorls are rich purplish red. A faint second zone is often traceable beneath the opaque white surface upon the base of the body-whorl. The labrum is bright yellow or orange, and the interior of the aperture is of a very dark purplish red tint. The umbilical callus is generally yellowish, but occasionally pale and glossy.

A single specimen is opaque white above, with scattered subhyaline wavy streaks and spots. The apex, however, is of the same opaque character, and conspicuous, as in the other specimens. *H. dentoni*, Pilsbry, appears to be the same as this species.

EXPLANATION OF PLATE II.

Figs. 1, 2.	<i>Papuina acrope.</i>
Figs. 3, 4.	<i>Papuina hero.</i>
Fig. 5.	<i>Papuina ianthe.</i>
Figs. 6, 7.	<i>Nanina infelix.</i>
Figs. 8, 9.	<i>Macrochlamys papuana.</i>
Figs. 10, 11, 12.	<i>Charopa nigrofusca.</i>
Fig. 13.	<i>Pupinella strubelli.</i>
Fig. 14.	<i>Helicina pachystoma.</i>
Fig. 15.	<i>Helicina solitaria.</i>
Figs. 16, 17, 18.	<i>Cyclotus horridus.</i>
Fig. 19.	<i>Omphalotropis papuensis.</i>

CURRENT LITERATURE.*

By E. R. SYKES, B.A., F.Z.S., and S. PACE, F.Z.S.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review.

I. CLASSIFICATION AND NEW FORMS.

A. RECENT FORMS.

Bavay, A.—"Coquilles nouvelles, provenant des récoltes de M. L. Levay, dans les rapides du Haut-Mékong, pendant la campagne du Massie, 1893-4-5." Journ. de Conch., vol. xliii., pp. 82-94, pl. v., *pars*, vi.

Brazier, J.—"New species of Cone from the Solomon Islands." Pro. Linn. Soc., N.S.W., vol. x, p. 471.

Dall, W. H.—"New species of *Leda* from the Pacific Coast." Naut., vol. x., pp. 1-2.

Dall, W. H.—"Diagnoses of new Mollusks from the Survey of the Mexican Boundary." Proc. U. S. Nat. Mus., vol. xviii., pp. 1-6.

New Land and Freshwater Mollusks, with a scheme for breaking up the genus *Holospira*.

Dall, W. H.—"Diagnoses of new species of Mollusks from the West Coast of America." Proc. U. S. Nat. Mus., vol. xviii., pp. 7-20.

New species of Marine Univalves and Bivalves. Two interesting new genera are characterised: one, *Anaplocamus*, is "probably referable to the family Trichotropidae, as the peculiar production of the aperture, the thick, brown epidermis, and the curious operculum all have points in common with species of *Trichotropis*." The other, *Tractolira*, "appears to be a degenerate abyssal form of Volutidae."

Garstang, W.—"On *Doris maculata*, a new species of Nudibranchiate Mollusc found at Plymouth." Journ. Mar. Biol. Assn., n.s., vol. iv., pp. 167-8.

The species may be recognised by its orange colour and "the presence, on the back, of a number of conspicuously [purple] coloured tubercles, connected with one another by a network of low ridges."

Gude, G. K.—"Description of a new species of *Vitrina*, and new forms of Helicidae, with a list of the Helicoid shells hitherto found in the Canary Islands." Proc. Malac. Soc., vol. ii., pp. 15-22, figs.

Gude, G. K.—"Description of *Streptaxis paulus*, a new species." Proc. Malac. Soc., vol. ii., p. 23, fig.

Hedley, C.—"Notes on Mollusca from the Alpine Zone of Mount Kosciusko." Rec. Austral. Mus., vol. ii., pp. 101-5, pl. xxiii., *pars*.

A new *Endodonta* and a new *Flammulina*.

Hedley, C.—"Description of *Pugnus*, a new genus of Ringiculidae from Sydney Harbour." Rec. Austral. Mus., vol. ii., pp. 105-6, pl. xxiii., *pars*.

* An asterisk denotes that the work has not been seen. The bibliography is carried up to June 1st, 1896.

Joubin, L.—"Note complémentaire sur un Céphalopode d'Amboine." Rev. Suisse Zool., iii., pp. 459-60, 1896 (1895).

M. Joubin places his *Loligo picteti* in the genus *Ideosepius*, Steenstr.

Kobelt, Dr. W.—"Systematisches Conchylien Cabinet." Band. i., heft: cxxxi.-cxxxii. (contain Bullacea, pp. 1-72, pls. A, B, v.-xiv.)

Kobelt, Dr. W., and Rolle, H.—"Diagnosen neuer Pomatien." Nach. Mal. Ges., 1896, pp. 34-7.

Melville, J. C., and Ponsonby, J. H.—"Description of seven new species of Terrestrial and Fluvial Mollusca from the Hadramaut, S. Arabia." Proc. Malac. Soc., vol. ii., pp. 1-3, pl. i.

Monterosato, Marquis, T. de.—"Note sur le Genre *Barlecia*, Clark." Journ. de Conch., vol. xliii., pp. 77-9.

Pilsbry, H. A.—"Description of a new *Gastrodonta*." Naut., vol. ix., pp. 123-4.

Pilsbry, H. A.—"New American Ancyliidae." Naut., vol. ix., pp. 137-9.

Pilsbry, H. A.—"Note on *Carychium exile* (C. B. Adams)." Naut., vol. x., p. 12.

Pilsbry, H. A.—"New species of the Helicoid Genus *Polygyra*." Proc. Acad. Nat. Sci., Philad., 1896, pp. 15-20, pls. ii-iii.

Pilsbry, H. A.—"Descriptions of new species of Mollusks." Proc. Acad. Nat. Sci., Philad., 1896, pp. 21-4, figs.

Of the genera *Marginella*, *Ischnochiton*, and *Sagda* (?).

Pilsbry, H. A.—"Manual of Conchology, ser. 1, part 63 (contains vol. xvi., pp. 113-160, pls. 32-43); ser. 2, p. 39 (contains pp. 97-144, pls. 26-40). Philadelphia, March, 1896.

The *Aplysiidae* are continued in the Marine series. The new genus *Paraplysia* (type *Aplysia piperata*, Smith) is fully described. A new section of *Petalifera*, Gray, is proposed under the name of *Pseudaplysia*, type *Phyllaplysia punctulata*, Tap.-Can. The following are new species:—*Dolabrifera jacksoniensis* (N. S. Wales), *D. nicaraguana* (Nicaragua), and *D. swiftii* (W. Indies). Several useful synopses of species are given under their respective genera.

In the second series, the part opens with a key to the sub-genera of *Auris*, of which *Eudolichotis* is now proposed for *A. distorta*, Brug., and allies. After an enumeration of the species of *Auris*, we pass to *Bulinulus*, Leach: this is divided into three groups—(a) apical whorls smooth; (b) apical whorls irregularly wrinkled subvertically, or with the wrinkles wavy, dislocated or variously broken into granules; (c) apical whorls with regular, straight vertical riblets. Such a division is also in agreement with the geographical distribution. The first of these divisions, containing the single sub-genus *Bostryx*, occupies the remainder of the part: several divisions of the sub-genus are used, of which *Geoceras* (type *B. columellaris*, Reeve) is new.

Simroth, Dr. H.—"On *Neohyalimax brasiliensis*, n. gen., n. sp. (allied to *Hyalimax*), from Brazil." Proc. Malac. Soc., vol. ii., pp. 39-45, pl. v.

Simroth, Dr. H.—"Über bekannte und neue Urocycliden." Abh. Senck. Ges., Frankft., vol. xix., pp. 281-312, 2 pls.

Sowerby, G. B.—"Description of *Cassia adcocki*, a new species [from South Australia]." Proc. Malac. Soc., vol. ii., p. 14, fig.

Sterki, Dr. V.—"New North American *Pisidia*." Naut., vol. ix., pp. 124-5.

Suter, H.—"Descriptions of some new land Mollusca from New Zealand and Macquarie Island." Proc. Malac. Soc., vol. ii., pp. 23-8, pl. iv.

New species of *Lagocheilus* (2), *Athoracophorus* (1), *Endodonta* (2), and *Laoma* (6).

Woodward, B. B.—“On a proposed classification of the *Pelecypoda*.” Nat. Sci., vol. viii., pp. 239-244.

Wright, Berlin H.—“New Florida Unios.” Naut., vol. ix., pp. 121-2, pl. ii.

Wright, Berlin H.—“New American *Unionidae*.” Naut., vol. ix., pp. 133-5, pl. iii.

See also Brancsik (IV. A), Collinge (IV. A), Ijima and Ikeda (II.), and Sowerby (IV. A).

B. FOSSIL FORMS.

Ami, H. M.—“Note on *Cardinia subangulata*, Dawson, and *Arca punctifer*, Dawson.” Ottawa Natural., x., p. 44, 1896.

The above specific names being pre-occupied, the following are proposed:—*C. angulifera* and *A. puncticostata*.

Dautzenberg, Ph., and Dollfus, G.—“Du nom spécifique qu'il convient d'attribuer au *Corbula* qui caractérise les sables de merxem.” Proc.-Verb. Soc. Mal., Belg., 1896, pp. xviii.-xxi.

Di-Stefani, G.—[See IV. B: “Lo scisto marnosa . . .”]

The following new species:—*Trochus integrostriatus*, *Protomerita? garganica*, *Promathildia pellatii*, *P. kittli*, *Natica squinaboli*, *Pseudomelania adriatica*, and *Actaeonina (Cyliindrobullina) lesinensis*.

Hicks, H.—[See IV. B: “Morte Slates.”]

The following new Molluscs:—*Modiolopsis barricanensis* and *Pterinata mortensis*.

Jukes-Browne, A. J., and Hill, W.—[See IV. B: “Delimit. Cenom.”]

Contains critical remarks on many forms, and description of *Ammonites (Acanthoceras) pentagonus*, n. sp. and n. var., *compressus* of *A. (Ac.) hippocastanum*, Sharpe.

Pilsbry, H. A.—“*Pleurotomaria crotaloides*, Morton, in the New Jersey Cretaceous.” P. Ac., Philad., 1896, pp. 10-1.

*Stremouchow, M. D.—“Note sur la *Posidonomya buchi*, Roemer des schistes de Balaclava en Crimée.” Bull. Soc. Moscow, 1895, pp. 391-5, pl., 1896.

Woodward, H.—“On a Fossil Octopus, *Calais newboldi* (J. de C. Sby., MS.), from the Cretaceous of the Lebanon.” Quart. J. Geol. Soc., vol. lii., pp. 229-34, pl. vi. and fig., *Abs.* in Ann. Nat. Hist. (s. 6), vol. 17, p. 258. Also contains figure and description of *Plesioteuthis fraasi*, n. sp.

See also Degrange-Touzin (IV. B) and Gorjanovic-Kramberger (IV. B).

II. ANATOMY, HISTOLOGY, DEVELOPMENT AND PHYSIOLOGY.

Amandrut, Alexandre.—“Sur les poches buccales et les poches oesophagiennes des Mollusques.” C. R. Ac. Sci., vol. cxxii., pp. 1218-1221.

André, E.—“Le pigment mélanique des Limnées.” Rev. Suisse Zool., iii., pp. 429-31, 1896 (1895).

Appellöf, A.—[Rev. of *Mitsukuri, K., and Ikeda, S.: “Notes on a gigantic Cephalopod.” Zoöl. Mag., vii., pp. 39-50.] Zoöl. Centralbl., iii., p. 220, 1896.

(A new species of *Architeuthis*, having a total length of 380 cm., though apparently not full-grown).

Bloch, Isaak.—“Die embryonale Entwicklung der Radula von *Paludina vivipara*.” Jenai-Zeitschr. Natur., vol. xxx., pp. 350-392, pls. xix., xx., xxa.

Boycott, A. E.—"Respiration in Limnaea" (with supplement by **Bowell, E. W.**). Devonia, 1896, pp. 94-5 (6).

Burne, R. H.—"Note on the Anatomy of *Hanleya abyssorum*, M. Sars." Proc. Malac. Soc., vol. ii., pp. 4-13, pl. ii., 3 figs., 1896.

The first part of this paper deals with the vexed question of the presence and position of an osphradium in the Chitons; the second consists of notes on the pedal and anterior buccal commissures and the heart.

***Chatin, J.**—"Sur les macroblastes des huîtres; leur origine et leur localisation." C. R. Ac. Sci., vol. cxxii., pp. 796-9, 1896.

Collinge, W. E.—"On a Collection of Slugs from the Sandwich Islands." Proc. Malac. Soc., ii., pp. 46-51, 6 figs., Bibl.

Descriptions of portions of the anatomy of *Agriolimax globosus*, n. sp., *A. perkinsi*, n. sp., *Amalia gagates* (Drap.), and *Tebennophorus striatus* (Hasselt).

Cossmann, M.—[Rev. of **Dall, W. H.**: "A new Classification of the Pelecypoda." Tr. Wagner Inst., iii.] J. Conchyl., xliii., pp. 112-22, 1896.

Crampton, H. E.—"Experimental Studies on Gasteropod Development." Arch. Entwickl., iii., pp. 1-19, pls. i.-iv., and appendix by **Wilson, E. B.**, 1896.

Fischer, H. [Rev. of several papers by **Bouvier** bearing on the question of the inter-relationships of the *Prosobranchiata*, *Opisthobranchiata*, and *Pulmonifera*.] J. Conchyl., xliii., pp. 103-6, fig., 1896.

***Girard, A. E.**—"Sur le *Thyrophorella thomensis*, Greef., gastéropode terrestre muni d'un faux opercule à charnière." J. Sci. Lisb. (2), T. 4, xliii., pp. 28-32, 1896, 1 pl.

Hedley, C.—[Appendix to the Molluscan part of the Rep. of the Horn Scientific Expedition. See IV. A: **Tate, R.**]

Deals with the anatomy of *Bithinia australis*, Tryon; *Microphyura hemi-clausa*, Tate; *Thersites setigera*, Tate; *Xanthomelon fodinalis*, Tate; *X. adcockiana*, Bednall; *X. squamulosa*, Tate; *X. grandituberculata*, Tate; *X. arcigerus*, Tate; and *Liparus spenceri*, Tate. The affinities of *Microphyura* are shewn to be with *Laoma* and *Flammulina*, not with the *Rhytididae*.

Henneguy, L. F.—"Leçons sur la Cellule, Morphologie et Reproduction." Paris, 1896, 541 pp., 4to., 362 figs., Bibl.

This forms the most comprehensive treatise on cytology which has up to the present appeared.

Ijima, I., and Ikeda, S.—"Description of *Opisthoteuthis depressa* n. sp." J. Coll., Japan, vol. viii., pp. 323-37, pl. 33.

The octopod herein described is a most remarkable one, on account of its enormous antero-posterior compression; its shape is that of a plano-convex disc (with only the tips of the arms projecting), 55 mm. in diameter, and having a maximum thickness of only about 8 mm., in the single immature specimen obtained. No trace of a radula was discovered, though its absence was not definitely proved. Is it possible that we may be here dealing with a parasitic form? There is something about the general sucker-like shape and the reduction or absence of the radula suggestive of this hypothesis.

Koehler, R.—"Revue annuelle de Zoologie." Rev. Gen. Sci., vii., pp. 213-, 1896.

Reviews (pp. 215-7, figs. 3-4) the work of **Kerr** and **Haller** on *Nautilus*, and **Huxley** and **Pelseneer** on *Spirula*.

Korschelt, E.—[Rev. of ***Fujita, T.**: "Preliminary note on the Mesoderm Formation of Pulmonata." Zoöl. Mag. (Tokyo), vii., pp. 1-5.] Zoöl. Centralbl., iii., 218-220.

(The form investigated was *Siphonaria lepida*, and in this form the process was found normal.)

Kostanecki, K. V., and Wierzejski, A. "Ueber das Verhalten der sogen. achromatischen Substanzen im befruchteten Ei. Nach Beobachtungen an *Physa fontinalis*." Arch. Mikr. Anat., xlvii., pp. 309-86, pls. xviii.-xx., Bibl.

Lang, A.—"Text-book of Comparative Anatomy." English translation by **H. M. and M. Bernard.** Part II., London (Macmillan, 17/-), 1896, 8^{vo.}, xvi. & 618 pp., 473 figs.

This volume, which deals with the Mollusca, Echinodermata and Entero-neusta, though in the main a translation of the third and fourth parts of Dr. Lang's well-known and most excellent "Lehrbuch," is, however, an improvement on the German work, as the Molluscan portion has been revised by Mr. B. B. Woodward, and an index has been added. The book, as it stands, is undoubtedly the most reliable and most up-to-date text-book of Molluscan Morphology.

***Lee, A. Bolles.**—"Sur le Nebenkern et sur la Formation du Fuseau dans les Spermatocysts des *Helix*." Cellule, xi., pp. 223-6, 257-60, 1896.

Lenhossék, M. V.—"Histologische Untersuchungen am Sehlappen der Cephalopoden." Arch. mikr. Anat., xlvii., pp. 45-120, pls. vi.-viii., 3 figs.

Linden, M. Von.—"Die Entwicklung der Skulptur und der Zeichnung bei den Gehäuseschnecken des Meeres." Zeitschr. Wiss. Zoöl., lxi., pp. 261-317, pl. xi., Bibl.

Mazzarelli, G. "Intorno al Rene secondario delle larve degli Opistobranchi." [Abs. of paper in Boll. Soc. Napoli, vol. ix.] Monit. Zoöl. Ital., vol. iii., p. 86, 1896.

Pelseneer, P.—[Rev. of **Babor, J. F.**: "Ueber das Centralnervensystem von *Dreissensia polymorpha*, Pall." S. B. Bömisch Ges., xlviii., 1895.] Zoöl. Centralbl., iii., pp. 365-6, 1896.

Pelseneer, P.—"Les reins, les glandes génitales et leurs conduits dans les Mollusques." Zoöl. Anz., vol. xix., pp. 140-5.

Pilsbry, H. A.—[Parts 39 and 63 of Tryon's "Manual of Conchology." See I. A.]

Contain a considerable amount of information on the soft parts of Pulmonates and Opisthobranchs respectively.

***Plate, L.**—"Ueber einige Organisationsverhältnisse der Chitonen (zweite vorläuf. Mittheil.), mit polemischer Schlussanmerkung gegen Bela Haller." S. B. Ges. naturf. Berlin, 1896, pp. 42-50.

Rohde, E.—"Ganglienzellkern und Neuroglia." Arch. mikr. Anat., vol. xlvii., pp. 121-35, pl. ix.

Ruedemann, R.—"Note on the Discovery of a Sessile Conularia—Article I." Amer. Geol., xvii., pp. 158-65, pls. viii.-ix., 1896.

Sampson, L. V.—"The Musculature of Chiton." J. Morphol., xi., pp. 595-628, pls. xxxi.-iii., Bibl., 1895.

Simroth, H.—"On *Neohyalimax brasiliensis*, n. gen., n. sp. (allied to *Hyalimax*)." Proc. Malac. Soc., vol. ii., pp. 39-45, pl. v.

Simroth, H.—[Rev. of **Pelseneer's** "Prosobranches aériens et pulmonés branchifères."] Zoöl. Centralbl., iii., 214-7, 1896.

Simroth suggests that *Ianthina* may obtain oxygen directly from the air, the roof of the mantle cavity being folded.

Simroth, H.—[Rev. of **Dall's** and **Smith's** reports on, respectively, the "Albatross" and "Investigator" Mollusca.] Zoöl. Centralbl., iii., pp. 211-3, 1896.

Simroth, H.—"Neuere Arbeiten über die Amphineuren und die Phylogenie der Mollusken." Zoöl. Centralbl., iii., pp. 153-63.

- Simroth, H.—"Neuere Arbeiten über Pulmonaten." Zoöl. Centralbl., iii., pp. 189-91.
- Trinchese, S.—"Sul sistema nervoso del *Phyllobranchus borgnini*." Rend. Acc. Napoli, s. 3, vol. ii., pp. 37-8, 1896.
- Wilson, E. B.—"On Cleavage and Mosaic-Work." Arch. Entwickl., iii., pp. 19-26, 4 figs. (appendix to Crampton's paper), 1896.

III. BIOLOGY, HABITS AND TERATOLOGY.

- Brockmeier, H.—"Beiträge zur Biologie unserer Süßwassermollusken." Forschungst. Biol. St. Plön, 1896, pp. 248-62, 6 figs.
- Brockmeier, H. "Einige Mittheilungen über Mollusken." Verh. Ges. deutsch. Naturf., 67 Vers., vol. 2, pp. 112-3, 1896.
- Fielder, W.—"Intermediate Hosts of Fluke" (first note). Victorian Natural., xii., pp. 139-40.
Parasitic in freshwater Pulmonates.
- Gain, W. A.—"Enemies of our Land and Freshwater Molluscs." Naturalist's Journ., vol. v., pp. 78-9.
- Kennard, A. S. "Introduction of Mollusca into Britain." Sci. Goss., n.s., vol. iii., pp. 12-13.
- Oldham, C.—"Note on the habits of *Vertigo edentula*, Drap." J. Conch., viii., p. 190, 1896.
Living on Butterbur.
- Roebuck, W. D.—"Otters feeding on Freshwater Mussels." The Naturalist, no. 248, March, 1896, p. 90.
- Walker, Bryant.—"On certain abnormal *Sphaeria*." Naut., vol. ix., pp. 135-7.
- See also Linden (II.).

IV. DISTRIBUTION AND FAUNA.

A. RECENT FORMS.

- Adams, Lionel E. "The Mollusca of Northamptonshire." Journ. Northants. Nat. Hist. Soc., vol. viii., pp. 255-67.
- Allen, E. J. "Notes on Dredging and Trawling work [at Plymouth] during the latter half of 1895." Journ. Mar. Biol. Assn., n.s., vol. iv., pp. 164-6.
Records, *inter alia*, the first discovery of a Neomenian (*Dondersia banyulensis*, Pruvot) in the South of England.
- Bowell, E. W. W.—"British Land and Freshwater Shells (Part IV.)." Devonian, vol. i., part iv., pp. 91-3, figs.
- Brancsik, Dr. C.—"Nachtrag zur Mollusken-Fauna d. Trenesiner Comitates." Jahr. Nat. Ver. Trenesiner Comitates, Jahrg. xvii.-xviii., pp. 111-4.
- Brancsik, Dr. C. "Contributiones ad faunam Molluscarum insulae Papua." Jahr. Nat. Ver. Trenesiner Comitates, Jahrg. xvii.-xviii., pp. 209-228, pls. v.-vi.
An interesting contribution to the New Guinea fauna, with one new species.
- Bucquoy, E., Dautzenberg, Ph., and Dollfus, G.—"Les Mollusques Marins du Roussillon, vol. ii., pp. 541-620, pls. lxxix.-lxxxviii., May, 1896.

Continues the *Pelecypoda*.

Caziot.—"Faune Malacologique terrestre et fluviatile du departement de la Vienne (fin)." *Feu. Jeun. Nat.*, ser. 3, Mars, 1896, pp. 97-101.

Coates, H.—"Natural History of the banks of the Tay: the Mollusca." *Trans. Perthshire Soc. Nat. Sci.*, vol. ii., pp. 60-2.

Collier, E., and Standen, R.—"Further Conchological notes from the West of Ireland." *Journ. of Conch.*, vol. viii., pp. 177-190.

Collinge, W. E.—"On a Collection of Slugs from the Sandwich Islands." *Proc. Malac. Soc.*, vol. ii., pp. 46-51, figs.

Five species, of the known seven, are recorded, of which two *Agriolimax* are new.

Cooper, J. G.—"Catalogue of Marine Shells collected chiefly on the Eastern shore of Lower California." *Proc. Cal. Acad. Sci.*, ser. 2, vol. v., pp. 34-48.

Cooper, J. G.—"On Land and Freshwater Shells of Lower California, no. 5." *Proc. Cal. Acad. Sci.*, ser. 2, vol. v., pp. 163-5.

Cooper, J. G.—"On West Mexican Land and Freshwater Mollusca." *Proc. Cal. Acad. Sci.*, ser. 2, vol. v., pp. 166-9.

Crosse, H.—"Additions a la Faune Malacologique terrestre et fluviatile de la Nouvelle-Caledonie et de ses dependances." *Journ. de Conch.*, vol. xliii., pp. 79-82, pl. v. *pars*.

Includes a new *Placostylus*.

Dautenberg, Ph.—"Mollusques testacées recueillis dans les serres du Museum." *Bull. Mus. Hist. Nat.*, 1896, pp. 28-9.

Ford, John.—"Some references to the Genus *Oliva*." *Naut.*, vol. x., pp. 3-5.

Ihering, Dr. H. von.—"Os Unionidos da Florida." *Rev. do Mus. Paulista*, vol. i., pp. 207-222.

Keep, Prof. J.—"West Coast species of *Haliotis*." *Naut.*, vol. ix., pp. 129-132.

Kobelt, Dr. W.—"Die Geographische Verbreitung der Untergattung *Pomatia*, Leach." *Nach. Mal. Ges.*, 1896, pp. 25-34.

Latchford, F. R.—"Notes on Recent Canadian Mollusca." *Ottawa Nat.*, vol. x., pp. 14-16.

Lemon, J. H.—"Notes on some Ontario Shells." *Naut.*, vol. x., pp. 10-11.

Lowe, H.—"Cuttle Fishes washed ashore in San Pedro Bay." *Naut.*, vol. x., pp. 11-12.

*Martens, E. von.—"*Planorbis scalaris* aus einem See in Florida." *Sitzsber. Ges. Nat. Fr.*, Berlin, 1896, p. 16.

Monterosato, Marquis de.—"Note intorno alle Najadi Siciliane." *Nat.*, Sicil., figs.

Nelson, William.—"*Limnaea peregra*." *Int. Journ. Micr. and Nat. Sci.*, ser. 3, vol. vi., pp. 149-156.

Newcombe, C. F.—"Report on the Marine Shells of British Columbia." *Bull. N. H. Soc. Brit. Columbia*, 1893, pp. 31-72, *Bibl.*

Nobre, Augusto.—"Mollusques et Brachiopodes du Portugal." *Ann. Sci. Nat.*, Porto, an. iii., pp. 97-108.

Continuation of paper noted *ante* p. 13.

Oldham, C.—"The Land and Freshwater Mollusca of Cheshire." *The Naturalist*, no. 249, pp. 109-128.

Records 102 out of the 131 admitted by him as British.

Sargent, H. E.—"Annotated list of the Mollusca found in the vicinity of Clearwater, Wright Co., Minnesota (part second)." *Naut.*, vol. ix., pp. 125-8.

- Simpson, C. T.—"On the Mississippi Valley Unionidae found in the St. Lawrence and Atlantic Drainage Areas." *Amer. Natural.*, vol. xxx., pp. 379-84, 1896.
- Simpson, James.—"Supplement to Dawson's 'Mollusca of Aberdeen and the neighbouring sea.' " *Ann. Scott. Nat. Hist.*, no. 18, April, 1896, pp. 100-4.
- Sowerby, G. B.—"List of the Pleurotomidae of South Australia, with descriptions of some new species." *Proc. Malac. Soc.*, vol. ii., pp. 24-32, pl. iii.
- Sterki, Dr. V.—"A few notes on *Pisidia*." *Naut.*, vol. x., pp. 8-9.
- Streng, L. H.—"A new variety of *Limnæa*." *Naut.*, vol. ix., p. 123, fig.
- Sturany, Dr. Rudolf. "Mollusken welche anlässlich der österreichischen Tiefsee-Expeditionen S. M. Schiffes 'Pola,' 1890-4, gedredschit wurden." *Kais. Ak. Wiss. Wien.*, 1896, pp. 56-9.
- Sykes, E. R.—"A Scillonian form of *Helicella acuta*, Mull." *Devonia*, vol. i., part iv., p. 101, fig.
Specimens in which the blackish strigations or flammules are replaced by translucent white markings.
- Tregelles, G. F.—"The Marine Mollusca of Cornwall." *Journ. of Conch.*, vol. viii., pp. 190-200.
The first instalment of a very complete faunal list, with the nomenclature much more accurate than is usually found in British lists.
- Wright, Berlin H.—"Descent and Distribution of Unionidae." *Naut.*, vol. x., pp. 5-8.
- See also Bavay (I. A), Dall (I. A), Gude (I. A), Melvill (I. A), and Suter (I. A).

B. FOSSIL FORMS.

- Arthaber, G. von.—"Die Cephalopodenfauna der Reiflinger Kalke." *Beitr. Pal. Oesterr.-Ung.*, x., pp. 1-112, 10 pls., 1896.
- Arthaber, G. von.—"Einige Bemerkungen über die Fauna der Reiflinger Kalke." *Verh. geol. Reichsanst.*, 1896, pp. 120-6.
Some new names.
- Collier, E., and Standen, R.—"Further Conchological Notes from the West of Ireland." *J. Conch.*, viii., pp. 177-90, 1896.
Contains short account of Kitchen-Middens at Dog's Bay.
- *Cooke, J. H.—"Notes on the 'Pleistocene Beds' of the Maltese Islands. *Geol. Mag. (n.s., Dec., iv.)*, pp. 201-10, 1896.
- Degrange-Touzin, A.—"Les *Scalaridae* fossiles des terrains tertiaires supérieurs du sud-ouest." *Act. Soc. Bordeaux*, viii., pp. 313-21.
- Di-Stefani, G.—"Lo scisto marnoso con "*Myophoria vestita*" della Punta delle Pietre Nere in provincia di Foggia." *Boll. Com. Geol. Ital.*, xxvi., pp. 4-51, pls. i-ii., 1895.
- Dyducha, F.—"Gasteropoda ilow miocenskich w Rzegocinie (Wiadomosé tymczasowa)." *Kosmos*, xxi. (s. 4), pp. 207-8.
List of fossils.
- Gorjanovic-Kramberger.—"Ueber das Vorkommen der, *Pereirina gervaisii*, Vez. sp., in Croatien." *Verh. geol. Reichsanst.*, 1896, pp. 142-3.
Also contains list of associated Molluscs.
- Hicks, H.—"On the Morte Slates and Associated Beds in North Devon and West Somerset." *Quart. J. Geol. Soc.*, vol. lii., pp. 254-72, pls. x.-xi.
See I. B.

Holroyd, W. F., and Barnes, J.—“On the Rocks and Fossils of the Yoredale Series of the Marsden and Saddleworth Valleys.” Tr. Manchester Geol. Soc., vol. xxiv., pp. 70-91 (Discussion pp. 72-9), 13 figs., 1896.

List of Molluscan fossils.

Jukes-Browne, A. J.—“The Fossils of the Warminster Greensand.” Geol. Mag. (n.s., Dec., iv.), vol. iii., pp. 261-73, 1896.

Jukes-Browne, A. J., and Hill, W.—“A Delimitation of the Cenomanian:—being a Comparison of the Corresponding Beds in South-Western England and Western France.” Quart. J. Geol. Soc., vol. lii., pp. 99-178, pl. v. and Sections.

Lamplugh, G. W.—“On the Speeton Series in Yorkshire and Lincolnshire.” Geol. Mag., vol. lii., pp. 179-228, 1896.

Laville, A.—“Le gisement pléistocène a *Corbicules* de Cergy.” Bull. Soc. geol., France (s. 3), xxiii., pp. 504-7.

Mojsisovics, E. v.—“Beiträge zur Kenntniss der obertriadischen Cephalopodenfaunen des Himalaya.” (Abs.) S. B. Ak. Wien., 1896, pp. 126-7.

Newton, R. B.—Corrigendum (to paper noted *ante*, p. 15). Journ. of Conch., vol. viii., p. 208.

Newton, R. B.—“On the Identification of the *Acanthoceras mammillatum* and *Hoplites interruptus* Zones at Okeford Fitzpaine, Dorsetshire.” Geol. Mag. (n.s., Dec., iv.), iii., pp. 198-201.

Contains list of fossils collected by Miss Forbes and Miss Lowndes.

Redlich, K. A.—“Geologische Studien in Rumänien.” Verh. geol. Reichsanst., 1896, pp. 77-83.

Sharman, G., and Newton, E. T.—“Note on some Cretaceous Fossils from the Drift of Moreseat, Aberdeen.” Geol. Mag. (n.s., Dec., iv.), vol. iii., pp. 247-54.

Sykes, E. R.—“List of a small Collection of Mollusca from a Raised Beach on Portland.” P. Dorset Club, vol. xvi., pp. 171-4.

Teisseyre, L.—“Geologische Reiseberichte aus den Karpathen Rumäniens (District Bacau).” Verh. geol. Reichsanst., 1896, pp. 132-42.

Toula, F.—“Ueber die Auffindung einer Muschelkalkfauna am Golfe von Ismid.” N. Jahrb. Min., 1896, pp. 149-51.

Some new names without diagnoses.

Toula, F.—[Rep. of voyage to the Bosphorus and S. Coast of the Marmora Sea.] S. B. Ak. Wien., 1896, pp. 3-7.

List of fossils, containing several new names without descriptions.

Williams, H. S.—“On the origin of the Chouteau Fauna.” J. Geol., iv., pp. 283-90, 1896.

V. COLLECTING AND METHODS OF RESEARCH.

Elum, F.—“Ueber Wesen und Wert der Formolhärtung.” Anat. Anz., xi., pp. 718-27, Bibl., 1896.

Browne, M.—“Artistic and Scientific Taxidermy and Modelling. A Manual of Instruction in the Methods of Preserving and Reproducing the Correct Form of all Natural Objects. Including a Chapter on the Modelling of Foliage.” London (A. & C. Black, £1 1s. od.), 1896, 463 pp., 22 pls., 11 figs., Bibl.

This important work, though in the main dealing with Vertebrates, contains a mass of information on the methods of preserving Molluscs, and particularly full accounts of the methods of preparing glue and other casts.

Gerota, D.—"Contribution à l'étude du formol dans la technique anatomique." *Int. J. Anat. Physiol.*, xiii., pp. 108-39, 1896.

Although written from the point of view of the human anatomist, this paper should be read by all those interested in the preservation and fixation of zoölogical material for the museum or laboratory. The time will probably arrive when alcohol will be used as a preserving agent, especially by the zoölogist in the field, only in exceptional cases; as for most purposes Formalin is in every way superior.

Nusbaum, J.—"Einige Bemerkungen über das Aufkleben der Paraffinschnitte mit Wasser." *Anat. Anz.*, xii., pp. 52-4, 1896.

A very good description of this, the simplest and best method of fixing sections; it deserves to be better known.

VI. ECONOMICS.

Roché, G.—"Recherches statistiques sur l'Huître cultivée des côtes de France." *C. R. Ac. Sci.*, cxxii., pp. 955-7, 1896.

VII. BIOGRAPHY.

Gill, T.—"Huxley and his Work." *Science*, n.s., iii., pp. 253-63.

A memorial address given before the Scientific Societies of Washington.

NOTE.

On *Pterosoma plana*, Lesson.—At the June meeting last year of the Malacological Society of London, a paper by Mr. C. Hedley, F.L.S.,* was read claiming *Pterosoma plana*, Lesson, as a Heteropod. This conclusion was arrived at after a careful examination of several examples which had been "cast ashore by an easterly gale at Mavoubra Bay, near Sydney." In this paper it is stated that "seventy years ago the French scientific expedition fished up this species between the Moluccas and New Guinea, but never again till now has it been encountered by a naturalist." I would, however, point out that the true position of this mollusc was first shewn by Mr. C. Collingwood, F.L.S.,† in 1868, from a specimen dredged by himself in the Formosa Channel while naturalist on H.M.S. "Serpent" in 1866. As Mr. Hedley has overlooked this, I will give the full quotation:—"And here I may refer to several singular marine animals discovered by the towing-net in the Formosa Channel, which proved a rich locality for strange and rare forms. Among them was *Pterosoma* (*Pt. plana*), a transparent, delicately-tinted, winged animal, thick and gelatinous and almost invisible in the water. It belongs to a class of Mollusks known to naturalists as Heteropods, oceanic animals of anomalous forms with the foot variously modified for swimming. The *Pterosoma* was established as a genus by Lesson from a species he found swimming in the vicinity of New Guinea, but either the drawings of the animal are very badly executed in all the books, or the one found in my net must be a second species, for there is but little resemblance between them." This last statement is now confirmed by Mr. Hedley, as he has shewn that Lesson's drawing was made from a damaged specimen.

EDITOR'S NOTES.

Malacologists will be glad to hear that Mr. Charles Hedley has been attached as Zoölogist to the Expedition which is to make a boring in the coral atoll of Tunafuti, one of the Ellice Islands. We wish him all good fortune.

Our contemporary, *Deconia*, has now blossomed into print, and its readers will welcome the change.

*Proceedings of the Malacological Society of London, vol. I, page 333.

†Rambles of a Naturalist. Cuthbert Collingwood, M.A., F.L.S., &c., 1868, page 54.

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ON THE ANATOMY OF CHLORITIS (SULCOBASIS) STIROPHORA, E. A. SMITH,
& OF C. REHSEI, VON MARTENS.

By WILLIAM MOSS & WILFRED MARK WEBB, F.L.S.,

(PLATE III.)

In the "Guide to the Study of the Helices"* by Mr. Pilsbry the latter says that the anatomy of the snails placed in the section *Sulcobasis* of the genus *Chloritis* is unknown: since the making of this statement, the only contribution to the subject that we are aware of, is contained in a paper by Mr. Hedley† and deals with the internal structure of *Chloritis* (*Sulcobasis*) *rehsei* v. Martens.

Some time ago one of us received from Mr. Da Costa, three spirit specimens of *Chloritis* (*Sulcobasis*) *stirophora*, E. A. Smith together with a single example of *C. rehsei*. The former species was originally described as *Helix* (*Hadra*) *stirophora* by Mr. Edgar Smith who subsequently transferred it to the position which it now occupies because, he informs us "on the examination of a number of other and fresher specimens", he "noticed that the surface was minutely pitted in some places and evidently at one time was pilose."

The references are as follows:—

Helix (*Hadra*) *stirophora*. E. A. Smith, Ann. Mag. Nat. Hist., ser. 6, Vol. V. (March, 1895) pp. 231-2. Figured (Nov. 1895) pl. xx., fig. 9.

Chloritis (*Sulcobasis*) *stirophora*. E. A. Smith, Journ. of Malac., Vol. V., No. 2 (June, 1896), p. 17. No remarks.

* Manual of Conchology, ser. 2. Pulmonata, vol. ix., pt. 35 (August, 1894) p. 120.

† The Land Molluscan Fauna of British New Guinea, 2nd supplement, Proc. Linn. Soc., N.S.W. Vol. ix., ser. 2 (June 27th, 1894), p. 384.

An examination of the soft parts has been made by the writers and the following notes will serve in the first place as a corroboration of Mr. Smith's opinion and, in the second, together with those on the other species (*C. rehsei*) as a contribution to our knowledge of the section *Sulcobasis*.

In the two columns below some of the characters of the genera *Chloritis* and *Thersites* (= *Hadra*) are contrasted, those points which have been made out in *Chloritis stirophora* are italicized while the references in brackets are to pages in the "Guide to the Study of the Helices."

CHLORITIS.

SHELL—"Apical whorls and usually the whole shell sculptured with hair-points arranged in quincunx," thus—** (p. 118.)

ANIMAL—"Tail rounded, above with an impressed longitudinal median line—see below—Mantle edge bearing a small right body lappet. *(p. 117 *C. porteri*). Spermatheca duct, rather long and closely bound to the uterus—Plate III., figures 3 & 8. In Fig. 3 the spermatheca has been freed—penis cavity containing at the apex an imperforate fleshy papilla." (p. 117).

"A peculiar feature is that the epiphallus bears not only a short flagellum at its apex, but a curved 'talon.'"—Letter from Mr. Pilsbry,* August 19th, 1896. (See also figure of *C. argillacea*, Plate xxvii., figs. 8 & 9).

THERSITES.

SHELL—"Apex smooth, never granulated or punctate in regular quincunx" (p. 125).

ANIMAL—"Tail with a slight median longitudinal groove" (p. 126).

"The duct of the spermatheca generally long and swollen below" (p. 126).

"Penis enlarged distally where its cavity contains a solid papilla" (p. 126).

"The flagellum is shorter or obsolete (p. 126)."

"Nothing of the sort (*i.e.* 'talon' has been found in *Thersites*.)"—Letter from Mr. Pilsbry, August 19th, 1896.

In addition, it may be pointed out that the jaw of *C. stirophora*—Plate III, figure 6—seems most nearly to resemble that of *Chlorites*, while the radula, though of the general type common to this and allied genera, very closely resembles that of *C. rehsei*,

* A dissection was sent to Mr. Pilsbry (together with a jaw, a photograph of the radula and some notes), who agrees that the anatomy is decidedly that of *Chloritis*.

figured by Mr. Hedley.* The genital organs of the last mentioned species—Plate VI., figures 8 & 9—agree with those of *C. strophora* in all the particulars italicized above; it should be noted, however, that the duct of the spermatheca is “swollen below” as recorded for the genus *Thersites*. The “talon” is well shown and as Mr. Hedley’s drawing does not bring out this particular point and the spermatheca was broken off in his specimen, new figures have been given (Plate III, figures 8 & 9).

There are some features in which the two species under consideration differ, not only from the description given by Mr. Pilsbry for *Thersites*, but for the genus *Chloritis* as a whole, and which, perhaps, should be taken as being peculiar to the section *Sulcobasis*.

SULCOBASIS.

Tail above with a median row of large tubercles (in C. strophora. The foot was cut away in the other species), some of which are cleft to form a double row, while others present a trilobed appearance. No sign of a papilla in the penis cavity which was found in both species to have the interior walls wrinkled as figured and described by Mr. Hedley in C. rehsei.*

CHLORITIS.

“Tail above, with an impressed longitudinal median line” (p. 117, this is italicized by Mr. Pilsbry).

“Penis cavity containing at the apex a fleshy papilla” (p. 117).

On the other hand the spiral sulcations upon which the name *Sulcobasis* was founded are not to be seen on the undersides of the specimens of *C. strophora* that were examined.

It may be taken as proved that the species *strophora* is a true *Chloritis* and that *Sulcobasis* has more title to be retained as a separate section.

*The Land Molluscan Fauna of British New Guinea, 2nd supplement. Proc. Linn. Soc., N.S.W., Vol. IX., ser. 2 (June 27th, 1894), p. 384 Plate XXVI., fig. 25.

CURRENT LITERATURE.*

By E. R. SYKES, B.A., F.Z.S., and S. PACE, F.Z.S.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review.

I. CLASSIFICATION AND NEW FORMS.

A. RECENT FORMS.

See also: Bergh (II.), Schepman (IV. A), Simroth (IV. A), Willey (II).

Adams, L. E.—"*Limax maximus* L. var. *alba* nov. in Northamptonshire." J. Conch., viii., 228, 1896.

Baldwin, D. D.—"Description of Two New Species of Achatinellidae from the Hawaiian Islands." Nautilus x., 31-2, 1896.

Partulina hayseldeni and *Amastrea aurostoma*; both from Lanna.

Bernard, F.—"Diagnoses de Coquilles nouvelles de Lamellibranches (genres *Hochstetteria* et *Condylocardia*)." Bull. Mus. Paris, 1895, pp. 193-7.

The following are described without figures:—*H. costata*; *H. meleagrina*; *H. muniera*; *C. sancti-pauli* (Munier-Chalm., M.S.); *C. crassicosta*; *C. concentrica*; *C. australis* (M. Ch., M.S.)

Bernard, Felix. *Sciebrattia australis*, type nouveau de Lamellibranche. Bull. Soc. Ouest France, vol. vi., pp. 364-395, pl. xii-xv.

Boettger, O.—[See IV. A: "Mollusken d. Philippinen."]

The following new species:—*Syrnola heptagwa*, *S. manilensis*, *S. quadrasi*, *S. incerta*, *S. subcristata*, *Turbonilla quadrasi*, *T. dactylus*, *T. truncatula*, *Eulimella quadrasi*.

Dall, W. H.—"Note on *Neritina showalteri*, Lea." Nautilus x., 13-5, 1895.

New genus *Lepyrini* for this species, which has been re-discovered in Alabama. The operculum is destitute of calcareous layer and articular processes, and the radula differs from that of *Neritina*.

Dall, W. H.—"On the American Species of *Ervilia*." Nautilus x., 25-7, 1895.

E. maculosa, n. sp.

Drouet, H.—"Unionidae nouveaux ou peu connus (10^e article)." J. Conchyl., xliii., pp. 220-34 (1895), 1895.

The following so-called new species:—*A. frigida*, *A. orbicularis*, *A. fennica*, *U. sardicenis*, *U. polychsestus*, *U. hermicus*, *U. ephesinus*, *U. lydicus*, *U. aequilabratus*.

Fischer, H.—"Note préliminaire sur le *Pterygoteuthis giardi*, Cephalopode nouveau recueilli dans le cours de l'*Expédition scientifique du Talisman* (1883)." J. Conchyl. xliii., pp. 205-11., pl. ix. (1895), 1896.

P. giardi n. gen. et sp. The genus presents affinities with both the Onychoteuthidae and the Ommato-trephidae; the author places it in the former group.

* An asterisk signifies that the work has not been seen by the recorders. The bibliography is carried up to September 1st, 1896.

Fulton, H.—"Descriptions of new Species of *Nanina*, *Helix*, *Amphidromus* and *Porphyrobaphe*." Ann. Nat. Hist. (s. 6), vol. 18, pp. 100-4.

Includes a new section (*Xenothauma*) for a very interesting new species from Peru. The following are new species:—*N. (Oxytes) fidelis*; *H. (Xenothauma) baroni*; *A. sumbaensis*; *A. kalaoensis*; *P. approximata*; *P. vicaria*. We would point out that the first use of *Nanina* was by Risso (1826) for a marine shell; it therefore cannot be used for land molluscs.

Gude, G. K.—[See II., "Armature of Helicoid Land Shells."] *N. sp. Corilla fryae*.

Gude, G. K.—"A New Shell and Illustrations of some hitherto unfigured Helicidae." Sci. Gossip (N.S.) iii., 57-60, 8 figs.

Corasia lauræ, n. sp., see p. 5; and *Ganesella catocyrtæ*, *G. apex*, *Endodonta quadrasi*, *E. fusca*, *Trochomorpha boettgeri*, *Pyramidula omalisma* are figured.

H. W. E.—"Cephalopods of the North Atlantic" (Rev. of Joubins' Report on the P. of Monaco's Collections). Nat. Sci. ix., 124-5.

Hedley, C. and Willey, A.—"Description of a New Species of *Astrarium* from New Britain." P. Linn. Soc., N.S. Wales, xxi., 107-9, pl. 12, 1896.

A. (Guildfordia) n. sp. moniliferum near *A. triumphans*.

Hervier, J.—"Descriptions d'espèces nouvelles de l'Archipel Néo-Calédonien." J. Conchyl., xliii., pp. 141-52, 236-40 (1895), 1896.

The following new species:—*Drillia carnicolor*, *D. suavis*, *Clavus rugizonatus*, *C. protentus*, *C. gibberulus*, *C. leforestieri*, *Surcula gatchensis*, *Glyphostoma lamproideum*, *G. joussaeuwei*, *G. leucostigmatum*, *G. aubryanum*, *G. globulosum*, *G. disconicum*, *G. subspurcum*, *G. goubini*, *G. crosseanum*, *G. melanoxytum*, *G. tigroidellum*, *G. fastigiatum*, *G. strombillum*, *G. alphonsonianum*, *G. callistum*, *G. parthenicum*, *G. gaidei*, *G. trigonostomum*.

Ihering, H. von.—"Sur les *Arca* des côtes du Brésil et sur la classification du genre *Arca*." J. Conchyl., xliii., pp. 211-9 (1895), 1896.

*Joubin, L.—"Notes sur divers Céphalopodes trouvés dans l'estomac d'un Cachalot." Bull. Soc. Ouest France, v., pp. 13-18, 1896.

Joubin, L.—[See II., "Obs. divers céphalop."] *Abraaliopsis pfefferi*, n.g. et sp.

Abraaliopsis pfefferi, n.g. et sp.

Kobelt, W.—"Bullacea" in "Systematischer Conchylien-Cabinet von Martini und Chemnitz." Nuremberg, 1896 (pp. 73-144, pls. 15-9).

This part completes the Bullidae, Akeridae and Hydatinidae and begins the Philinidae. No new species are described.

Locard, A.—A propos de l'*Helix tenveri* de G. Michaud. Echange, pp. 17-18, 25-7.

Locard, A.—A propos de l'*Helix glabella* de Draparnaud. Echange, pp. 33-6.

Mabille, J.—[See IV. *A*: Moll. N. Hebrides.]

The following supposed new species:—*Neritina perfecta*; *N. exclamationis*; *N. françoisi*; *N. elephas*; *N. subgranosa*; *N. horrida*; *Navicella splendens*; *N. françoisi*; *N. concentrica*; *Helicina novella*; *Melampus arctius*; *M. enhalius*; *M. dignus*; *Placostylus françoisi*; *P. hebridarum*.

Newcombe, C. F.—"Some New or Rare Species of Marine Mollusca recently found in British Columbia." Nautilus, x., 16-20.

The list of species contains some new names, but without descriptions.

Pilsbry, H. A.—"Note on *Bulimus hanleyi* and *B. coronatus*." Nautilus, x., 46, 1896.

Synaptorpes n. gen. for these species; type, *B. hanleyi*.

- Pilsbry, H. A.—"A New Species of *Pomatiopsis*." *Nautilus* x., 37-8, 1895.
P. hinkleyi, from Alabama.
- Pilsbry, H. A.—"A New Species of *Bulimus*." *Nautilus* x., 41, 1895.
Anctus (?) *stearnsianus*, from Argentina.
- Pilsbry, H. A.—"A New Variety of *Punctum*." *Nautilus* x., 21-2, 1895.
P. conspectum var. *pasadanae*.
- Pilsbry, H. A.—"A Remarkable Central American Melanian." *P. Ac. Philad.*, 1896, pp. 269-70, fig.
Pachycheilus dalli, n. sp.
- Pilsbry, H. A. and Vanatta, E. G.—"Catalogue of the Species of *Cerion*, with descriptions of New Forms." *P. Ac. Philad.*, 1895, pp. 315-38, pl. xi.
New species:—*C. regina*; *C. sarcostomum*; *C. abacoense*; *C. tridentatum*; *C. eleutherae*; *C. blandi*; *C. multistriatum*; *C. basistriatum*; *C. duplodon*; *C. hyperlissum*. Also some new varieties.
- Pilsbry, H. A. and Vanatta, E. G.—"Revision of the North American Slugs: *Ariolimax* and *Aphallarion*." *P. Ac. Philad.*, 1895, pp. 339-50, pls. xii-iv. fig.
Aphallarion buttoni; n.g. et sp.
- Roper, E.—"A Word about Sphaeria." *Nautilus*, x. 29, 1896.
- Simpson, C. T.—"The Mussels (*sic.*) Scars of Unios." *Nautilus* x., 29-30, 1896.
"Seldom a mark of even specific value."
- Simpson, C. T.—(Rev. of Call's paper on the Unionidae of Kansas). *Nautilus* x., 35-6, 1896.
Discusses some questions of Synonymy.
- Smith, E. A.—[See IV. A : Land Shells from N. Guinea.]
The following new species:—*Charopa nigrofusca*; *Macrochlamys papuana*; *Omphalotropis papuensis*; *Pupinella strubelli*; *Helicina pachystoma*.
- Smith, E. A.—[See IV. A : "L. and F. W. Mollusca of Trinidad."]
Subulina (*Nothus*) *uric hi*, n. sp.
- Smith, E. A.—[See IV. A : Kolguev F.-water Shells.]
Limnaea ovata var. *nova kolguevensis*.
- Smith, E. A.—[See IV. A : Land Shells from S. Celebes.]
The following are new:—*Helicarion wallacei*; *Macrochlamys indifferens*; *Microcystina consimilis*; *M. consors*; *Xesta dimidiata*; *Hemiplecta bonthainensis*; *Chloritis howsaii*; *Calycia everetti*; *Clausilia celebensis*; *C. simillima*; *C. subpolita*; *C. usitata*; *Cyclotus pyrostoma*; *C. celebensis*.
- Smith, E. A.—[See IV. A : Land Shells of Selayar, &c.]
The following new species are described:—*Microcystina consueta*; *Xesta selayarensis*; *X. kalaoensis*; *Trochomorpha jampeana*; *Plectotropis crassiuscula*; *Planispira admirabilis*; *Helicostyla* (*Corasia*) *subtenuis*; *Hypselostoma everetti*; *Buliminus selayarensis*; *Cyclotus vicinus*; *Helicina kalaoensis*.
- Sterki, V.—"Descriptions of New *Pisidia*." *Nautilus* x., 20-1, 1896.
P. fallax and *P. vesiculare*.
- Sykes, E. R.—[See IV. A : "Polyplacophora of Pt. Phillip.]
Among the 22 species recorded in this paper the following are new:—*Ischnochiton* (*Haploplax*) *pura*; *I. wilsoni*; *Acanthochites pilsbryi*; *A.* (*Notoplax*) *glyptus*; *A.* (*N.*) *wilsoni*; *Chiton muricatus*, A. Ad., (*non* Tilesius) is re-named *C. limans*.
- Vayssiere, A.—[See II., *Nautilus*.]
The author admits only three recent species of *Nautilus*:—*N. pompilius*, Linn.; *N. macromphalus*, Sow.; *N. umbilicatus*, List.

B. FOSSIL FORMS.

See also Vincent (IV. B.)

Broadhead, G. C.—[See IV. B: "Devonian of N. Missouri."]

Pleurotomaria providensis, n. sp.

Buckmann, S. S.—"Notes on Jurassic Ammonites." Geol. Mag. (N. S., Dec. iv.), vol. iii., pp. 420-1.

Cossmann, M.—[Rev. of *Oppenheim P. "Neue Binnenschnecken aus dem Vicentiner Eocän" (Zeitschr. deutsch. geol. Ges.)] J. Conchyl., xliii., pp. 187-8 (1895) 1896.

Cossmann, M.—[See IV. B: "Moll. éocén. Loire-Inf."]

The following spp. nn.:—*Limnæa bourdoti*; *L. gautensis*; *L. adela*; *Bulimus dumasi*; *Auricula simplex*; *A. citharella*; *A. houdasi*; *Scarabus bonneti*; *Ophicardelus sinuosus*; *Marinula labrosa*; *Siphonaria granicosta*; *Actæon dumasi*; *Crenilabium suturatum*; *Scaphander tenuistriatus*; *Bullinella brachymorpha*; *B. rideli*; *Plicobulla* (n. sg.) *dumasi*; *Cylichnella bourdoti*; *Amphisphyræ subcylindrica*.

Crick, G. C.—"On *Goniatis cœlatus*, Phillips, and *Nautilus tetragonus*, Phillips, with a list of the species belonging to the genus *Subclymenia*." Geol. Mag. (N.S. Dec. iv.), vol. iii., pp. 413-19, figs., 1895.

Dollfus, G. and Dautzenberg, P.—"Description d'une nouvelle espèce de *Chlamys des faluns de l'Anjou*." Bull. Soc. Ouest France, vi., 1-3, 1895.

C. (Pallium) apollo, n. sp.

Engel, ——"Ueber einige neue Ammonitenformen des schwäbischen Jura." Jahresh. Ver. Württemb., vol. 52, pp. lxiv.-lxxvi., 1895.

Landois, H.—[See III., "Riesen-Ammoniten."]

Pachydiscus seppenradensis, n. sp.

Mayer-Eymar, C.—"Descriptions de Coquilles fossiles des terrains tertiaires supérieurs (suite)." J. Conchyl., xliii., pp. 152-64, pls. vii., 1-5, viii. (1895) 1896.

The following new species:—*Pectunculus varicosatus*, *Cardita guillemetæ*, *Nerita dujardini*, *N. oxystoma*, *N. præserpine*, *Natica de-francei*, *N. epigonina*, *N. johannæ*, *N. lunata*, *N. turonensis*, *N. virginialis*, *Ficula fischeri*.

Monod, G. H.—"Une espèce nouvelle à la Hève." Rev. Scient. (s. 4) v., 59, 1896.

Close to *Emarginula sanctæ-cristinæ*.

Oppenheim, P.—[See IV. B: "Das Alttertiär der Colli Berici."]

The following new species of Mollusca:—*Pecten venetorum*; *Lucina astarte*; *L. consors*; *Cardium minarum*; *C. peregratum*; *Cytherea lucinæformis*; *Psammobia granconensis*; *Corbula leonina*; *Patella cassis*; *Calliostoma salomoni*; *Trochus leoninus*; *T. granconensis*; *Collonia beyrichi*; *Discorhynchus beyrichi*; *Littorina zwenckensis*; *Turritella lapillorum*; *Siliquaria anguiniiformis*; *Cerithium rauffi*; *C. juliae*; *C. vulcaniforme*; *Bittium subplicatulum*; *Marginella pseudovoluta*; *M. amphora*; *Bulla magnifica*; *B. incisa*; from Zovenceolo. *Modiola postalensis*; *Cardita bericorum*; *C. granconense*; *Marginella quinqueplicata*; *Voluta bericorum*; from Grancona. *Cerithium vivarii* nom. mut. = *C. elegans* Desh. (non Blainv.) = *C. winkerauffi*, Tourn.

Pavlow, A. P.—[See IV. B.]

Part ii. and pl. xxvii. treat of "the English and German Species of *Ancella*."

Pompeckj, J. F.—[See IV. B: "Ammoniten des schwäbischen Jura."]

The author divides the Swabian species of *Lytoceras* into three groups: (a); that of *L. fimbriatum* (Sow); (b) of *L. villae*, Menegh; and (c) that of *L. articulation* (Sow).

The following are the new species:—*L. salebrosum*, *L. coarctatum*, *L. irregulare*, *L. rugiferum*, *L. taeniatum*.

Tate, R.—[See IV. B: "Horn Exped."]

The following new species of Mollusca are described and figured:—*Orthoceras ibiciforme*, *O. microlineatum*, *O. larapintense*, *O. chewingsi*, *Endoceras arenarium*, *Trochoceras recticostatum*, *Eunema larapinta*, *Scalites* (?) *cremos*, *Pleurotomaria larapinta*, *Isoarca etheridgei*, *I. castii*, *I. corrugata*, *I. orbicularis*, *I. crassatellaeformis*, *I. opiformis*, *I. wattii*, *Palaearca wattii*, *P. tortuosa*, *Pteronites micans*.

Vincent, E.—"Description d'un bivalve nouveau trouvé dans le Landenien inférieure." Ann. Soc. malac. Belgique, xxix. (1894), pp. xxii-iv., 1 fig., 1896.

Arcomya (*Argyromya*) *fallax*, n. sp.

Vincent, E.—[See IV. B: "Belgian Eocene Neritae."]

N. daelei, n. sp.

Vincent, E.—[See IV. B: "Pinna."]

The following new species:—*P. consobrina*, *P. propinqua*.

Vincent, E.—"Description d'un bivalve nouveau (*Periploma rugosa*) de l'étage Panisélien." Ann. Soc. malac. Belgique, xxix. (1894), pp. lxvii-iii., 1 fig., 1896.

Vincent, E.—Note préliminaire sur *Limopsis*. Proc.-Verb. mal. Soc. Belg., 1896, pp. xxxiv.-xxxix., figs.

Six species are found in the Belgian Eocene, of which *L. lucida* is described as new.

Vincent, G.—"Une nouvelle espèce du genre *Chlamys*." Ann. Soc. malac. Belgique, xxix. (1894), pp. lix.-x., 1896.

C. flandrica, n. sp.

Vincent, G.—[See IV. B: "Sabels Landeniens."]

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II. ANATOMY, HISTOLOGY, DEVELOPMENT AND PHYSIOLOGY.

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Auerbach, L.—"Untersuchungen über die Spermatogenese von *Paludina vivipara*." Jena, zeitschr, xxx, 405-554, pls. xxi-ii., Bibl., 1896.

Babor, J. F.—"Über die wahre Bedeutung des sog. Semper'schen Organes der Stylomatophoren." S. B. böhmisch Ges. 1895, 20 pp., 2 pls., 1896.

The Author holds that the so-called Semper's organ represents a buccal salivary gland and homologizes it with the ant. salivary glands of the Cephalopoda, the pharyngeal glands of the Amphineura, the buccal glands of the Prosobranchs, and the 'gland. ptyalinae' of the Opisthobranchiata. The Semperian glands are ectodermal in origin, being derived from the stomadaeal epithelium.

***Bedot, M.**—"Note sur les cellules urticantes." Rev. Suisse Zool. iii, 533-9, 1896.

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- Bergh, R.—"Beitrag zur Kenntniss der gattungen *Narica* und *Onustus*." Verh. Ges. Wien. xlvii., pp. 200-12, pls. ii-iii., 1896.
- Anatomy, &c. of *N. cancellata* (Chem.) and *O. trochiformis*, Born.
- Bernard, F.—"*Scioberetia australis*, Type nouveau de Lamellibranche." Bull. Sci. France, Belgique, xxvii., 364-89, 90-5, 3 pls, 1896.
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- Chatin, J.—"Sur une coloration, d'origine hêpatique, chez l'huître." C. R. Ac. Sci. cxxii., 1556-9, 1896.
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- Gude, G. K.—"Armature of Helicoid Land-shells; and a New Species of *Corilla*." Sci. Gossip. (N.S.) iii., 88-92, 11 figs, 1896.
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- *Haswell, W. A.—"Note on Certain Points in the Arrangement and Structure of the Tentaculiferous Lobes in *Nautilus pompilius*." P. Linn. Soc., N. S. Wales (2) x. 544-8, pl., 1896.
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Pilsbry, H. A. and Vanatta, E. G.—[See I. A. "*Ariolimax* and *Aphallarion*.]

Aphallarion (n.g.) is like *Ariolimax* but the penis is completely wanting, being replaced by a short epiphallus.

Pilsbry, H. A. and Vanatta, E. G.—[See I. A. : "*Cerion*."]

Anatomy of the genitalia of *C. yumaense* P. & V., described and figured.

*Plate, L.—"Über die Buccalmusculatur der Chitonen." S. B. Ges. naturf. Berlin, 1896, pp. 68-9.

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III. BIOLOGY, HABITS AND TERATOLOGY.

See also Lloyd (II.), Vayssiere (II.), Willey (II.).

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Carrington, J. T.—"Roosting of *Helix pomatia*." Sci. Gossip (N.S.), iii., 82, 1896.

On twigs, "sometimes as much as four feet from the ground."

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*Knauthe, K.—(Pearls in *Unio restratus*). Zoöl. Garten, xxxvii., p. 155, 1896.

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Meli, R.—[See IV. B: "Sulla esistenza di Strati. . . ."]

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*Mobius, K.—"Perlen aus *Modiola modiolus* (L.) von der Küste Norwegens." S. B. Ges. naturf. Berlin, 1896, pp. 67-8.

Oldham, C.—"Carnivorous Habits of *Limax agrestis*." Zoölogist (S. 3), xx., 264, 1896.

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L. agrestis feeding on *Aphis*.

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Willey, A.—"On a rare Variation in the Shell of *Pterocera lambis*, Linn." *P. Linn. Soc. N. S. Wales*, xxi., 110-2, pl. xiii., 1896.

Intercalated digitation.

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We extract the fact that over a million *Skenca planorbis* would be required to balance one *Mastra solidissima*, and that a ton of the smaller species would contain 18,144,000,000 individuals.

IV. DISTRIBUTION AND FAUNA.

A. RECENT FORMS.

See also Arnold (IV. B), Branch (III.), Brandt (III.), Dall (I. A), Kennard (III.), Ihering (I. A), Newcombe (I. A), Scott (VI.), White (III.)

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Blazka, F. de P.—"Die Mollusken-Fauna der Elbe-Tümpel." *Zoöl. Anz.*, xix., 301-7, 1896.

Boettger, O.—"Die marinen Mollusken der Philippinen" (v. & vi.) *Nährbl. deutsch. malak. Ges.*, xxviii., 41-56, 1896.

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*Brancsik, K.—"Toldalék Trencsén vármegye Mollusca-faunájához." *Jahresh. Ver. Trencsen*, 1896, pp. 111-4.

*Brancsik, K.—"Ein Ausflug auf Nachbargebiet." *Jahresh. Ver. Trencsen*, 1896., pp. 90-9.

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List of Molluscs obtained, &c.

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[See I. A.]

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[See I. A.]

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[See I. A.]

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[See I. A.]

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B. FOSSIL FORMS.

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NOTE.

Corasia lauræ, Gude.—Testa imperforata, orbiculate depressa, tenuis, obliquis creberrimis striis distincta, quae striis spiralibus decussantur; subpellucida, nitida, pallide coerulea; media pars anfractus ultimi vivide coerulescens, fascia lutea sub sutura ornata; spira convexa, obtusa; apex pallide lutea vel albida; sutura leviter impressa; anfr. $4\frac{1}{2}$, convexi; periphæria acute carinata, pars superior paulum crenulata; anfr. ultimus antice breviter deflexus; apertura obliqua, subtrigona; peristoma simplex, tenue, margine superiori paulum expanso, gibboso, luteo, basali breviter reflexo, columellari arcuate declivi, compresso, paulum excavato, ex albido coerulescens.—Diam. maj. 19-25, min. 16-22, alt. 11-13 mm.



Corasia lauræ. Gude.

Hab.—North Luzon, Phillipine Islands.

Shell imperforate, orbiculate depressed, thin, obliquely and closely striate, decussated with spiral lines, sub-pellucid, shining, pale blue; the middle of the last whorl vivid blue, with a yellow band under the suture; spire convex, obtuse; apex pale yellow or whitish; suture slightly impressed; whorls $4\frac{1}{2}$, convex; periphery acutely keeled, the upper side of the keel slightly crenulate; last whorl shortly descending in front; aperture oblique subtrigonal; peristome simple, thin; upper margin slightly expanded, gibbous, yellow; basal margin shortly reflexed; columellar margin arcuately sloping, compressed, slightly excavated, bluish white.

The shell here figured was received by me from Mr. Hugh Fulton, of 216, Fulham Road, London, under the name of *Corasia psittacina*, Desh., but on comparison with the description and figure of that species, "Journal de Conchyliologie," ix., (1861), p. 350, t. 16, f. 3-5, it was evident that the two shells were distinct, and this opinion was confirmed by an examination of the specimens of *Corasia psittacina* in the British Museum collection. Although undoubtedly belonging to the phylum of *Corasia psittacina*, the characters which separate *Corasia lauræ* from that species, are sufficient to warrant its being raised to specific rank, and as it does not appear to have been previously characterized, I venture to publish it as a new species. It differs from *Corasia psittacina* in having the whorls more flattened; it has an acute compressed keel which is crenulated above, while in *Corasia psittacina*, the periphery is rounded and sub-angular; the last whorl is less widened towards the aperture, more contracted behind the peristome, and abruptly descending in front; the aperture is more triangular in outline, the margins are more approximating, and the columellar margin is more arcuate and less sloping. All the specimens which Mr. Fulton obligingly showed me, six or seven in number, agreed in the above-noted characters, but, as already indicated, some variation in size was observable. This beautiful species is named in honour of Miss Laura Andrew.—(SCIENCE-GOSSETT, New Series, vol. iii., August, 1896, p. 57. By kind permission of the Editor).

REVIEWS.

A Monograph of the Land and Freshwater Mollusca of the British Isles, by J. W. TAYLOR, F.L.S., Part III. Taylor Bros., Leeds, pp. 129-192, figs. 287-377 (6/-).

The same care and attention to detail on the scientific side and the same excellency as regards artistic production which has, up to the present, characterized this Monograph, is once more evident in the present number.



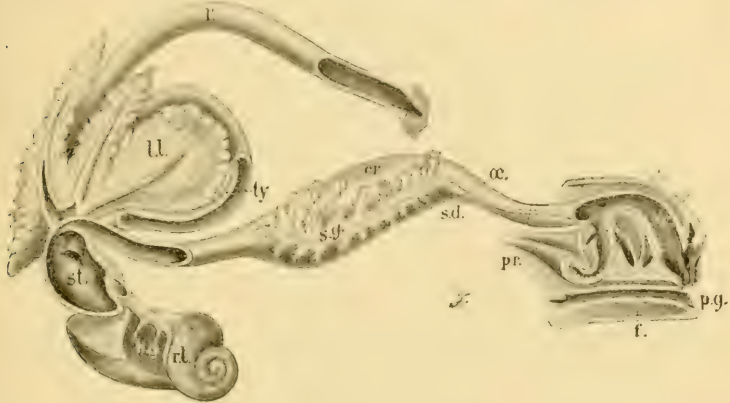
"FIG. 311." Eye of *Helix pomatia*, highly magnified (after Simroth). *c.*, inner cornea; *cu.*, cutis; *cl.*, crystalline lens; *ep.*, epithelium, becoming thin and transparent, and forming the outer cornea; *o.m.*, outer membrane or sclera; *op. n.*, optic nerve; *ret.*, retina; *t. n.*, tentacular nerve.



"FIG. 337." Otocyst of *Anodonta cygnea*, highly magnified (after Simroth). *aud. n.*, auditory nerve; *c. t. c.*, connective tissue cells; *cu.*, cuticle or enclosing membrane; *ep.*, ciliated and sensory epithelial cells, supported upon cellular tissue; *ot.*, otolith.

The instalment is again devoted to those general considerations which are so useful to the student of malacology and so absolutely necessary, one would say, to those who wish to work at our British non-marine shells, but who

have no knowledge of zoölogy nor of molluscan anatomy. Part III., after a few pages on which the description of the shell is completed, and a list of papers appertaining to this portion of the subject, deals with anatomy as far as those forms go, which come within the scope of the Monograph. There are generalizations given that apply to the Gastropoda and Pelecypoda, while the snail and fresh-water mussel are described in detail, as types of these classes respectively. This part of the work is elaborately illustrated by original drawings and by others, many of them "after Howes"; it must be allowed, too, that these latter are seen to greater advantage in the Monograph than on the crowded lithographic plates of Howes' "Atlas of Biology." Some specimens of the illustrations are here given through the courtesy of Mr. Taylor, and Figure "316" will give an idea of the anatomical representations, while Figures "311," "337," and "329" will shew the detail that is gone into.



"FIG. 316." Alimentary canal of *Helix aspersa* with appended glands dissected out and seen from the right side. The generative, circulatory, excretory and nervous systems removed and the buccal cavity, stomach, bile ducts, intestinal canal and pedal gland opened up (after Howes).

b.c., buccal cavity, showing radula, radular sac and jaw; *cr.*, crop; *f.*, foot; *h.g.*, hermaphrodite gland or ovotestis; *l.l.*, left lobe of liver; *o.c.*, oesophagus; *p.g.*, pedal gland; *p.r.*, pharyngeal or buccal retractor; *r.*, rectum; *rl.*, posterior lobe of the liver; *s.d.*, salivary duct; *s.g.*, salivary gland; *s.t.*, stomach; *ty.*, typhlosole.

The statement is made (p. 184) that a fuller account of the organs individually," detailing the differentiations in structure and function they each undergo and referring to the phylogenetic and other points of interest in connection therewith;" the last eight pages form the beginning of this account



"FIG. 329." Dart of *Helix aspersa* $\times 4$.

which should prove exceedingly interesting to judge by the instalment given which completes the head and its organs and begins the "pedal or ventral region." An interesting figure shews the underside of *Helix aspersa* seen from below through a slip of glass on what it is crawling.

In conclusion let one say that Mr. Taylor has compiled this portion of his book with such sound judgment that even those who have been conchologists

in the restricted sense of the word will not weary of the details which he has been so bold as to include, and the hope may be expressed that the small Malacological public may thus be materially augmented.

The Collector's Manual of British Land and Freshwater Shells, by LIONEL E. ADAMS, B.A., Taylor Bros., Leeds, 8vo., 214 pp., 10 plates, (8/-; with coloured plates, 10/6.)

One is often asked by those who are attracted to the study of our land and freshwater shells, to name a book which they might obtain as a guide in following the fancy that they have taken. Up to the present, it has been difficult to find a work which shall possess the several necessary qualifications, for the good books are mostly out of print, which also means out of date, and therefore not advisable for a beginner to have, even if he be prepared to give the price that will be asked when a copy comes into the market.

Mr. Adams' "Collector's Manual" seems "to fill a gap" so to speak, and besides being up-to-date and of reasonable price, does really enable even those who know nothing about the subject, to discover the name of a shell unknown to them. The reviewer tested the book by giving it and two typical species to an absolute novice, who found the proper generic and specific names on the first trial in each case without any difficulty.

It would not be doing justice to the book, to leave the impression that it is only suitable for beginners; it is very pleasant reading to "an old hand," and the experienced collector may also find the "Manual" of considerable service. One can here find an opportunity for saying a word in praise of the tabular form of comparison which one is glad to see that Mr. Adams adopts on a number of occasions with a large measure of success. The writers of Faunas and, perhaps, more often of Floras seem to forget as a rule that the poor individual who has taken upon himself to name a species of animal or plant often has but that one species before him. In this case such remarks as "not so large as the last" or "like the four last species but with smaller flowers" only savour of the classical expression, "about as big as a lump of chalk" and not being descriptions at all are just so much waste of words. It must not be imagined that even Mr. Adams is absolutely definite in all cases, but taken as a whole his comparisons are really helpful.

There is a very good introduction to the Manual on methods of collecting and preserving shells, but passing on to the systematic part one cannot as a "lumper" (which is the name used in the preface) help thinking that the space given up to a lot of indefinite varieties might, with greater usefulness, have been devoted to a good synonymy of the various species. In looking through this latter part one notices many praiseworthy emendations, though, while alterations were being made, *Hyalinia*, which cannot stand for the shells known until recently as *Zenites* should have been superseded by *Vitrea* as pointed out by Mr. Smith in his presidential address to the Conchological in 1890,* this last name is however used by Mr. Adams as a sub-generic title, and containing rightly *V. cristellina*. Mention is made as a rule when species are ovo-viviparous, and a note might well have been added to the same effect in the case of *Clausilia biplicata*, one of the synonyms of which is *C. vivipara*, Held. A glossary is given, and the pronunciation of classical names is indicated by accents, but *Limnaea peregrina* still retains its wrongful spelling of *peregrina*. Furthermore, it should be pointed out that the first specimens of *Paludetrina jenkinsi* received by Mr. Smith, who named the species, were not given to him by Mr. Jenkins from Plumstead, but by Mr. Walter Crouch from Becton.† Again *Anodonta anatina* is still retained as a good species in spite of the opinions held to the contrary by many good observers, and *Arion* should come under Helicidae.

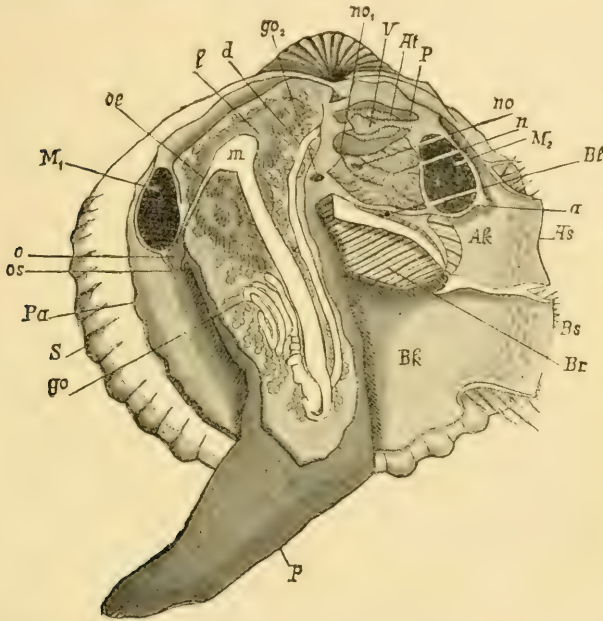
The illustrations on the plates are with a few exceptions good while the frontispiece which is the reproduction of a photograph of the smaller *Pisidia* is excellent. The Distribution Tables are a useful feature of the work.

* J. of Conch., vol. vi. (1891) p. 339.

† Essex Nat., vol. iv. (1890) p. 212.

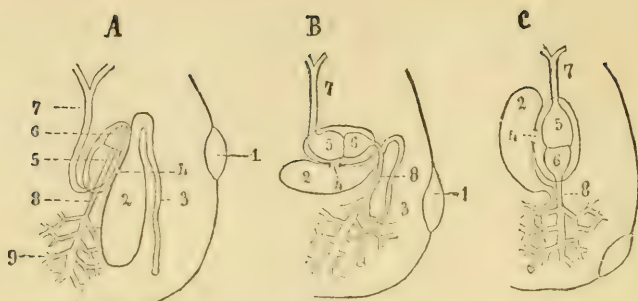
Text-book of Comparative Anatomy by DR. ARNOLD LANG, translated by HENRY M. BERNARD, M.A., and MATILDA BERNARD, **Part III.**, London (1896) Macmillan & Co., Chapter I, Mollusca, 283 pages 8vo, 222 Figures, Bibliography (17/- nett).

In the last number of *THE JOURNAL* (p. 27) It was stated that the molluscan portion of this volume (in which also the Echinodermata and Enteropneusta are described) is an improvement on the original German edition in-so-much as it "has been revised by Mr. B. B. Woodward and an index added," and is, as it stands, "undoubtedly the most reliable and most up-to-date text-book of molluscan morphology."

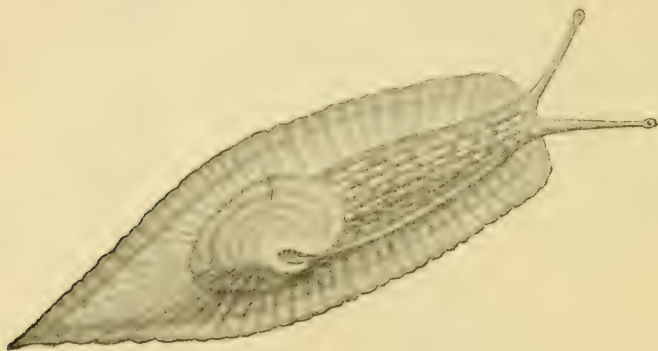


"FIG. 26." Anatomy of *Cardium tuberculatum* left aspect (after Grobben, Leuckart and Nitsche, Zool. Wandtafeln) *p.*, foot; *go.*, gonad; *S.*, shell; *Pa.*, mantle; *os.*, labial palps; *o.*, mouth; *M.*, anterior adductor muscle; *oe.*, oesophagus; *m.*, stomach; *d.*, digestive gland; *l.*, intestinal canal; *go.*, genital aperture; *no.*, pericardial aperture of the kidney; *V.*, ventricle; *At.*, auricle; *P.*, pericardium; *no.*, aperture of the kidney in the mantle cavity; *n.*, kidney; *M.*, posterior adductor; *Bl.*, point of concrescence of the right and left ctenidia behind the foot; *a.*, anus; *Ak.*, anal chamber of the mantle cavity with anal siphon *As.*; *Bk.*, branchial chamber of the same cavity with branchial siphon *Bs.*; *Br.*, ctenidium.

The book consists of a systematic review to begin with (see next page for classification adopted) but the main portion is devoted to sections having an organ or systems of organs for a heading under which each class is discussed in turn, while interspersed are other no less valuable divisions dealing with the primitive mollusc, phylogeny, ontogeny, parasitic and attached gastropods, and an exhaustive attempt to explain the asymmetry of the gastropoda. By the kindness of the publishers one is able to give three figures which are typical of the treatment accorded to general anatomy ("Fig. 26") to comparative anatomy ("Fig. 14") and to external characteristics ("Fig. 13.")



"FIG. 74." Diagrams to illustrate the changes in position in the pallial organs of *Dauterbaria* and *Testacella* (adapted from figures by Plate). *A.*, *Dauterbaria rufa*; *B.*, Hypothetical stage; *C.*, *Testacella*. 1, respiratory aperture; 2, kidney; 3, ureter or urinary duct; 4, reno-pericardial aperture; 5, ventricle; 6, auricle; 7, aorta; 8, pulmonary vein; 9, pulmonary vascular network.



"FIG. 13." *Peltella palliolum* (Bulimulid, after Férussac).

Classification adopted.

Class I. AMPHINEURA

- Order i. Placophora (Polyplacophora) sive Chitonidae
- Order ii. Aplacophora sive Solenogastres

Class II. GASTRODODA

- Order i. Prosobranchiata
 - Sub-order 1. Diotocardia (Zeugobranchia (Rhipidoglossa Aspidobranchia))
 - (b) Azygobranchia
 - (c) Docoglossa
- Sub-order 2. Monotocardia (Pectinibranchia)
 - (a) Architaenioglossa
 - (b) Taenioglossa (includes Heteropoda)
 - (c) Stenoglossa
- Order ii. Pulmonata
 - Sub-order 1. Basomatophora

Sub-order 2. Stylomatophora

- (a) Monogonopora
- (b) Digonopora

Order iii. Opisthobranchiata

Sub-order 1. Tectibranchiata

- (a) Cephalaspidae (including Pteropoda thecosomata)
- (b) Anaspidae (including Pteropoda gynosomata)
- (c) Notaspidae

Sub-order 2. Ascoglossa

- (a) Steganobranchia
- (b) Cirrobranchia
- (c) Pterobranchia
- (d) Abranchia
- Sub-order 3. Novibranchia
 - (a) Holohepatica
 - (b) Cladohepatica

Class III. SCAPHOPODA

Class IV. LAMELLIBRANCHIA

Order i. Protobranchia

Order ii. Filibranchia

Order iii. Pseudolamelli-branchia

Order iv. Eulamelli-branchia

- Sub-order 1. Submytilacea
- Sub-order 2. Tellinacea
- Sub-order 3. Veneracea
- Sub-order 4. Cardiacea
- Sub-order 5. Myacea
- Sub-order 6. Pholadacea
- Sub-order 7. Anatinacea

Order v. Septibranchia

Class V. CEPHALOPODA

Order i. Tetrabranchia

Order ii. Dibranchia

- Sub order 1. Decapoda
- Sub-order 2. Octopoda

W. M. W.

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VOL. V.

LIST OF THE CLAUSILIAE OF SOUTH AMERICA
WITH THE DESCRIPTION OF A NEW
SPECIES.

By E. R. SYKES, B.A., F.Z.S.

(PLATE IV.)

The species of *Clausilia* already known, belonging to the South American group, appear to be the following:—

PORTO RICO.

C. tridens, Chemn.

UNITED STATES OF

COLOMBIA.

C. bartletti, H. Ad.

C. blandiana, Pfr.

var. *ciocolatina*, Ancey.

C. bogotensis, Bttg.

C. dohrni, Pfr.

Synonym *C. perplexa*,
Sykes.

C. epistomium, Küster.

Synonym *C. pseud-*
epistomium, Brgt.

C. funcki, Pfr.

C. karsteniana, Dohrn.

C. magistra, Sowerby.

C. maranhonensis, Albers.

C. perarata, von Martens.

C. stylina, Ancey.

VENEZUELA.

C. cyclostoma, Pfr.

ECUADOR.

C. bourcierii, Pfr.

C. buckleyi, Higgins.

C. crosseii, Hidalgo.

C. deyrollei, Ancey.

C. perezi, Jousseau.

C. rehrei, Jousseau.

PERU.

C. adamsiana, Pfr.

C. adusta, Bttg.

C. andeloca, Morelet.

C. angrandi, Morelet.

C. chacaensis, Luborm.

C. filocostulata, Luborm.

C. flachi, Bttg.

C. jolyi, Bttg.

C. malcolata, Phil.

C. peruana, Trosch.

C. quadrata, Bttg.

C. raimondii, Phil. (1867)
(non *C. raymondi*, Bgt.,
1863)

C. slosarskii, Luborm.

C. steeriana, Sykes.

C. taezanowskii, Luborm.

C. trigonostoma, Bttg.

BOLIVIA.

C. boliviana, Sykes.

C. orbygni, Ancey.

Where these species have been placed in a subgenus at all, the name *Nenia* has been used. This was first published by H. & A. Adams (1855) who adopted the section from Charpentier (1852), he having only designated it by a number. The species so placed were in each case *C. epistomium* and *C. tridens*. Some authors have located *C. dohrni* in *Balea*, but since the type of this genus is *B. perversa*, L., such reference seems erroneous.

While certain of the species fall easily into groups, the others still appear to be isolated forms, and our present knowledge of the South American *Clausiliae* is insufficient to enable us to properly separate them, any endeavour to do so being premature.

The species I described as *C. perplexa* appears to me now to be only a form of *C. dohrni*, and it has therefore been placed in the synonymy of that species. I think it is also very probable that *C. magistra* is a variety of *C. karsteniana* and that *C. jolyi* is a form of *C. filocostulata*: since, however, I have not seen authentic specimens of some of these, I hesitate to definitely unite them.

C. funcki, Pfr., is a difficult species to classify; still it appears to belong to the *Clausilia* group, though of a somewhat aberrant form.

C. cyclostoma was described by Pfeiffer as from the Corean Archipelago; subsequently he stated that it was probably South American, while in the 'Nomenclator Heliceorum Viventium' it appears as from Venezuela, and a specimen in my collection is said to have come from "Quito, Peru," which I assume refers really to the Quito in Ecuador. The real habitat therefore remains uncertain.

Bourguignat varied the spelling of *andecola* to *andicola*, that of *dohrni* to *dorhni* (err. typ.?), and changed *maranhonensis* to *maranhonica*: these alterations appear to me to be unnecessary.

Clausilia evae, n. sp. (Plate IV., Figures 1, 2, 3.)

Testa fusiformis, tenuiuscula, corneo-fuscula, parum nitens; apex obtusus, non decollatus; anfr. $8\frac{1}{2}$ plano-convexi, lente accrescentes, primi laeves, reliqui sat distanter costulato-striati, costulis undulatis, interstitiae laeves, anfr. ultimus ante aperturam multius costulato-striatus quam anfr. penultimus, subtus modice angustatus, basi rotundatus, applanatus; sutura impressa; apertura magna, fere circularis, basi recedens, peristomate con-

tinuo, soluto, late reflexo, leviter incrassato. corneo-albido; lamellae modicae, superior marginalis, fere verticalis, inferior valde oblique ascendens, sub-columellaris nulla; plica principalis curta, valida; lunella conspicua, valida, arcuata. Alt. 41 millim.; diam. max. 8.5 millim.; alt. apert. 9 millim.; lat. apert. 9 millim.

Habitat: South America.

I regret not to be able to give the exact habitat of this handsome species, the single specimen of which is in the collection of Miss de Burgh, who kindly lent it so that it might be figured and described.

While dealing with these forms, a word with regard to '*Bulimus clausilioides*, Reeve,' may be of interest. This shell has at various times been placed in *Balea* and *Temesa*. The former is clearly erroneous; with regard to the latter, the original species so placed were *australis*, Forbes, *clausilioides*, Reeve, and some forms of *Alophia*. Mr. Hedley has recently transferred the former species to *Perrieria*, and Mr. Pilsbry following this has left *clausilioides* as the type of *Temesa* in his work on the Bulimoid forms.

This result appears to me to be very unsatisfactory. *Australis* was the first species of *Temesa*, and therefore when it proved not to be a *Coelaxis*, as Mr. Hedley showed, it should have stood as the type of the genus. It appears so for two reasons: firstly, because *Temesa* has more than 20 years' priority over *Perrieria*; and secondly, because *australis* does not accord well with *clausiliaciformis*, Tapp.-Canefri, which is the type of this latter genus, though the author's somewhat vague original description would cover it. I think, therefore, that *australis* must stand under *Temesa* and *clausilioides* will require, if it is to be placed in a section by itself, a new sectional name.

EXPLANATION OF PLATE IV.

- | | | | |
|--------------------------------|---|-----------|----------------------------------------|
| <i>Clausilia evae</i> , n. sp. | { | FIGURE 1. | The shell life-size. |
| | | FIGURE 2. | Mouth of the shell $\times 2$. |
| | | FIGURE 3. | The same seen from behind $\times 2$. |

CURRENT LITERATURE.

By E. R. SYKES, B.A., F.Z.S., and S. PACE, F.Z.S.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review.

We regret that it is not possible for us this quarter to present the Palaeontological portion of our Bibliography. Mr. Pace, owing to his approaching departure from England, has been unable to attend to it, and, as yet, we have not found a recorder who, being qualified and having sufficient opportunities, has been able to spare the necessary amount of time.

An attempt has been made, also, to save space by not inserting the names of authors, &c., in more than one section: cross-references at the close of each section being ample for the purpose. We believe that our readers will approve the change, as they will be enabled to survey the whole field in a smaller compass. The practice of inserting works "not seen" has also been given up, as otherwise works are recorded when only some favoured person has had the opportunity of perusing them. A striking feature of this quarter is the small amount of strictly anatomical work.

I. CLASSIFICATION AND NEW FORMS.

Ancey, C. F.—"Descriptions of some new shells from the New Hebrides Archipelago." *Nautilus*, x., 90-1.

Endodonta, *Melania*, and *Neritina*.

Boettger, Dr. O.—"Diagnosen neuer Clausilien." *Nach. Malak. Ges.*, 1896, 124-7.

Two species and three varieties from Asia Minor and Cyprus.

Brazier, John.—"On the new genus *Petterdiana*." *Proc. Roy. Soc. Tasmania*, 1894-5 [Aug., 1896], 105-6.

A new name (speaking strictly, not a new genus) for *Brazieria*, *Petterd non Ancey*; the type being the *Ampullaria tasmanica*, Ten.-Woods.

Clessin, S.—"Dentaliidae" in 'Conchylien-Cabinet.'" *Lief.* 422 and 424, pp. 48, pls. 11.

Rather incomplete.

Dall, W. H.—"Note on *Leda caelata*, Hinds." *Nautilus*, x., 70.

L. tufhrina nom. nov. = *L. caelata*, Hinds, *non* Conrad.

Dautzenberg, Ph., and Fischer, H.—"Dragages effectués par l'Hirondelle et par la Princesse-Alice, 1888-1895. I., Mollusques Gastéropodes [et Polyplacophores]." *Mém. Soc. Zool. France*, ix., 1896, pl. xv-xxii.

This elaborate memoir forms a valuable addition to our knowledge of the deep-water molluscs found off the Azores and in the Mediterranean: the depths at which dredgings were made having varied from forty to four thousand metres. The total number of species recorded amounts to 153, of which no less than 86 are described and figured as new. They are distributed in the following genera:—*Acmaea* 1, *Actæon* 1, *Alvania* 2, *Calliostoma* 3, *Cerithiella* 4, *Cerithiopsis* 1, *Cyclostrema* 2, *Cylichna* 1, *Danilia* 1, *Emarginula* 1, *Eulima* 11, *Fissurisepta* 2, *Fusus* 1, *Glyphis* 1, *Iphitus* 2, *Leptothyra* 1, *Marginella* 1, *Mitromorpha* 2, *Natica* 2, *Philina* 2, *Pleurotoma* 21, *Propylidium* 2, *Pseudomurex* 1, *Ringi-*

cula 1, *Rissoa* 1, *Roxania* 1, *Scissurella* 1, *Solariella* 2, *Solarium* 2, *Tharsis* 2, *Tinostoma* 1, *Trophon* 2, *Turbonilla* 6, *Turricula* 1.

This vast proportion of new forms would have been even greater had it not been for the previous publication by Mons. Dautzenberg on the fauna of the Azores. It should be noted that *Kryptos elegans* is proposed as a new genus and species from Jeffreys' MSS.: it is placed between *Sipho* and *Fusus*.

Dollfus, G.—"Consideration sur la délimitation des espèces animales." *Feu. Jeun. Natural.*, an. xxvii., 3-6.

Fischer, see Dautzenberg.

Kobelt, Dr. W.—"Eine Najadee aus Turkestan." *Nach. Malak. Ges.*, 1895, 102-3.
Anodonta sogdiana, from Buchara.

Kobelt, W.—"Columbella" in "Conchylien-Cabinet." *Lief.* 423, pp. 217-280, pl. 31-6.
Concludes his study of the group.

Marsh, W. A.—"New American *Unio*." *Nautilus*, x., 91-2.

Melville, J. Cosmo.—"Descriptions of new species of minute marine shells from Bombay." *P. Malac. Soc.*, ii., 108-116, pl. viii.

New species of the genera:—*Bittium* 1, *Cerithiopsis* 3, *Solarium* 1, *Rissoina* 2, *Adeorbis* 1, *Aclis* 2, *Eulima* 1, *Syrnola* 1, *Oscilla* 1, *Myonia* 1, *Miralda* 1, *Odostomia* 2, *Pyrgulina* 2, *Turbonilla* 4, *Cingulina* 1, *Phasianella* 1, *Tellina*, 1. We must congratulate the artist on the plate.

Melville, J. Cosmo, and Ponsonby, J. H.—"Descriptions of new Terrestrial Mollusca from South Africa." *Ann. Mag. Nat. Hist.*, ser. 6, xviii., 314-8, pl. xvi.

New species of *Ennea* (2), *Subulina* (3), *Pupa* (1), and *Cyclostoma* (1). The new *S. laeocochlis* is a remarkable large sinistral form, and the authors suggest that, should a new genus be required, the name *Euonyma* should be used.

Melville, James Cosmo, and Standen, Robert.—"Notes on a collection of shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with List of Species." *Journ. of Conch.*, viii., 273-315.

Though it might not be inferred from the title, this paper consists simply of the descriptions of 80 new marine species, with descriptive notes. The genera represented are:—*Murex* 1, *Nassa* 3, *Columbella* 2, *Scalaria* 2, *Drillia* 3, *Mangilia* 24, *Clathurella* 7, *Daphnella* 2, *Mitra* 1, *Bittium* 4, *Cerithiopsis* 6, *Turbonilla* 1, *Pyrgulina* 1, *Syrnola* 2, *Alaba* 1, *Litiopa* 1, *Alvania* 1, *Rissoina* 7, *Barleeia* 1, *Rissoa* 2, *Mathilda* 1, *Euchelus* 1, *Leucorhynchia* 1, *Alcyna* 1, *Minolia* 1, *Solariella* 1, *Cadulus* 1, *Tornatina* 1.

Moellendorff, see Quadras.

Pilsbry, H. A.—"Notes on new species of Amnicolidæ collected by Dr. Rush in Uruguay." *Nautilus*, x., 86-9.
Potamolithus is a new genus for the species from Uruguay of a similar type to the European *Lithoglyphus*.

Pilsbry, H. A.—"Manual of Conchology;" series 1, parts 61a and 64 (contain vol. xvi., pp. i-vii., 161-262, pls. 44-72, frontispiece), series 2, part 40 (contain vol. x., pp. i-iv., 145-213, pls. 1, 41-51).

In the Marine series we commence with the family Oxynoeidae, in which *Dipterophysis* is a new sub-genus of *Lobiger*, from which it may be distinguished by having only a single pleuropodial lobe on each side; the type and only species is *L. souverbii*, Fischer, from Guadeloupe. *Lobiger viridis*, Nevill non Pease, is re-named *L. nevilli*. We then pass through the Runcinidae and Umbraculidae (Umbrellidae of some authors) to the Pleurobranchidae; these divide into Pleurobranchinae and Pleurobranchaeinae, which may be characterized by the presence or absence of a shell. *Gymnctoplax* is a new genus which may be separated from *Pleurobranchus* and *Oscarus* by the shell being

partly exposed by an orifice in the mantle: the type is *Pl. americanus*, Verrill. *Pleurobranchus scutatus*, Martens non Pease, is re-named *P. martensi*. British collectors will not be gratified to find that the specific name *tuberculatus*, Meckel (1808), is used, apparently quite correctly, for the shell they know as *Pleurobr. membranaceus*, Mont. (1811). *Neda*, H. & A. Ad. non Mulsant, is re-named *Euselenops*. An introductory classificatory note is given, in which the Cephalaspidea are divided into groups by the presence or absence of an operculum, and by the radula. Finally, an appendix to vol. xv.—we would we could write vols. i.-xv.—is given: in this, *Aliculastrum* is a new name for *Alicula*, Ehrbg. non Eichwald, and the Tectibranchiate monograph is carried up to 1896, thus concluding the first Marine series. We hope shortly to welcome the opening parts of another series on the Marine bivalves, and trust they will be even more brilliantly executed.

In the Land series, Mr. Pilsbry continues his study of the Bulimuli of the sub-genus *Bostryx*. Four new species are described, namely:—*B. metamorphus*, from Chili; *B. crofolasta* and *B. flagellatus*, from Balsas, Peru; *B. ventanensis*, from Argentina. New names are *B. subcactorum* (= *lichenorum*, Reeve non D'Orb.), *B. raimondianus* (= *sfretus*, Phil. non Rve.), *B. dendritoides* (= *monticola*, Phil. non Roth.). An appendix to the volume is also given.

Ponsonby, see Melvill.

Quadras, J. F., and Moellendorff, O. F. von.—“Diagnoses specierum novarum ex insulis Philippinis.” Nach. Malak. Ges., 1896, 81-93.

Thirty-one new species, all unfigured and but curtly described.

Rolle, Hermann.—“Ein neues *Cardium* von der Nord-Japanischen Küste.” Nach. Malak. Ges., 1896, 113-5, plate.

Rolle, H.—“Diagnose (*sic*) eines neuer *Buccinum*.” Nach. Malak. Ges., 1896, 128.

B. martensianum, from Japan.

Simpson, C. T.—“Notes on the *farvus* group of Unionidae and its allies.” Nautilus, x., 57-9.

Smith, E. A.—“Natural History Notes from H.M. Indian Marine Survey Steamer ‘Investigator,’ Com. C. F. Oldham, R.N.—series ii., no. 22. Descriptions of new Deep-sea Mollusca.” Ann. Mag. Nat. Hist., ser. 6, xviii., 367-375.

New species of *Pleurotoma* 4, *Natica* 2, *Dentalium* 1, *Cardium* 1, *Yoldia* 1, *Cuspidaria* 1, *Myenera* 1, *Lyensia* 1, and *Serebicularia* 1: with critical notes on other species.

Sterki, Dr. V.—“Two new *Pisidia*.” Nautilus, x., 64-8.

Two more species added to the already somewhat swollen list of North American shells.

Sykes, E. R.—“On *Flammulina* (*Allodiscus*) *chion*, a new Helicoid Land-shell from New Zealand.” P. Malac. Soc., ii., 107, figs.

Sykes, E. R.—“Preliminary diagnoses of new species of non-marine Mollusca from the Hawaiian Islands. Part I.” P. Malac. Soc., ii., 126-132.

The following are described as new:—*Macrochlamys* 1, *Endodonta* 2, *Leptachatina* 4, *Amastre* 4, *Newcombia* 1. The author discusses the genera *Microcystis* and *Macrochlamys* and their types.

Wagner, Dr. A. J.—“Die Arten des genus *Dardebardia*, Hartmann, in Europa und Westasien.” Denksch Akad. Wiss. Wien., lxii., 609-626, 5 plates.

Though reprints of this paper have been issued for some time, the volume containing it has only recently made its appearance. The author divides *Dardebardia* into four sections: *Rifina*, Clessin; *Libania*, Brgt. (to which he adds a new species from Transcaucasia); *Carpathica*, nov. sect. (type *D. kima-kowiczii*, n. sp., from Siebenburgen); and *Illyrica*, nov. sect. (type *D. stussineri*, n. sp., from Croatia). Excellent figures of anatomy and shells are given.

- Westerlund, C. A.—"Neue Centralasiatische Mollusken." Ann. Mus. Zoöl. Ac. Sci. St. Petersburg, 1896, 181-198.
Various new species of land and freshwater Mollusca; no figures.
See also: In II., Bergh, Mazzarelli, Simroth, Sterki; in IV., Dall, Ihering, Locard, Pilsbry, Simroth.

II. ANATOMY, HISTOLOGY, DEVELOPMENT, AND PHYSIOLOGY.

- Bergh, R.—"Beiträge zur Kenntniss der Coniden." Abh. Kais. Leop. Akad., lxx., 87-214, pl. i.-xiii.
We hope to refer to this later.
- Brooks, W. K., and Drew, Gilman.—"Notes on the anatomy of *Yoldia*." Ann. Mag. Nat. Hist., ser. 6, xviii., 344-5.
- Gude, G. K.—"Armature of Helicoid Land-shells" (continued). Sci. Goss., 1895, 125-8, 154-6, 178-181, figs.
Deals with *Corilla* and *Plectophylis* and figures several species.
- Hornell, James.—"The eggs and young of Cephalopods." Journ. Mar. Zoöl., ii., 64-6, pl. vii., figs. A-C.
- Hornell, James.—"The visual organs of the Mollusca." Journ. Mar. Zoöl., ii., 66-72, pl. vii., figs. I.-XI.
- Joubin, L.—"Cephalopodes [du Campagne du 'Caudan']." Ann. Univ. Lyon, xxvi., 247-250, fig.
- McMurrick, J. Playfair.—"The Yolk-lobe and the Centrosome of *Fulgur carica*." Anat. Anz., xii., 534-9, figs.
- Mazzarelli, G.—"Intorno ad una nuova specie di *Phyllaplysia* (P. Fischer)." Boll. Soc. Nat. Napoli, ix., 81-2, figs.
P. faulini, n. sp., dealt with anatomically.
- Simroth, Dr. H.—"Bronn's Klassen und Ordnungen des Thier-Reichs: Bnd. iii.: Mollusca: Lief. 22 and 23 (contain part 2, pp. 1-64). September, 1896."
Commences the account of the Gastropoda.
- Sterki, Dr. V.—"The Systematic position of *Sphyradium* ("*Pupa*") *edentulum*, Drap." Nautilus, x., 75-6.
From an examination of the radula, Dr. Sterki arrives at the very interesting fact that this species is not a *Pupa* at all, but a Helicoid allied to *Punctum pygmaeum*, Drap.

III. BIOLOGY, HABITS, AND TERATOLOGY.

- Adams, Lionel E.—"Albino forms of *Littorina rudis*, var. *tenebrosa*." Journ. of Conch., viii., 315.
- Boycott, Arthur E.—"Erosion in Extra-Marine Mollusca." Sci. Goss., 1895, 114-6.
- Cockerell, T. D. A.—"The Label List for Five-banded Shells." Sci. Goss., 1895, 137.
- Crowther, J. E.—"The Common Pond Snail." Halifax Nat., i., 78-80.
- Dall, W. H.—"Recent advances in Malacology." Science, n.s., iv., 770-3.
- Edwards, Thos.—*Planorbis carinatus*, Müll., monst. *scalariforme*." Journ. of Conch., viii., 320, figs.
- Guignon, —.—"*Helix hortensis* avec ommatophore dichotomée." Feu. Jeun. Natural., An. xxvi., 240, fig.

Hornell, James.—"On surface tension as an aid to locomotion among marine animals." Journ. Mar. Zoöl., ii., 59-60.

Nudibranchs, *Cypraea*, *Aplysia*, and *Pleurobranchus* all crawl on the water in an inverted position; while *Eolis* and *Cypraea* suspend themselves by mucous threads.

Kimakowicz, M. von.—"Biologische Notizen über Mollusken." Verh. Mitth. Siebenburgen Ver., xlv. 57-8.

O'Connor, Frances Sarah.—"Spider carrying Snail-shells." Irish Nat., v., 299.

Spider carrying a shell which "was packed with what appeared to be spiders' eggs."

Olney, Mary P.—"Odour of snails." Nautilus, x., 84.

Ormsbee, C. C.—"Influence of Environment upon the form and colour of *Helix alternata*." Nautilus, x., 63-4.

The colours vary with those of the decaying woods in which they are found; the shape also varies with the form and size of the crevices in which they live.

P[ilsbry], H. A.—"*Limnaca bulimoides*, Lea, resisting drought." Nautilus, x., 96.

Revived after being packed in cotton for 45 days.

Shackleford, Lewis.—"The Shell-boring of carnivorous Gastropods." Journ. of Conch., viii., 315.

IV. DISTRIBUTION AND FAUNA.

Adams, Lionel E.—"*Limax marginatus*, Müll. (= *L. arborum*, B. Ch.), in Northamptonshire." Journ. of Conch., viii., 251.

Adams, Lionel E.—"Interesting Kentish forms [of land shells]." Journ. of Conch., viii., 316-320.

Bradshaw, Mrs. M. F.—"Extract from a note book." Nautilus, x., 82-4.
Relates to shore collecting in Newport, Cala.

Campbell, Mrs. E. D. G.—"Marine Shells on the Southern Californian Coast." Nautilus, x., 56-7.

Cooper, J. E.—"Note on the occurrence of *Petricola pholadiformis*, Lamk., at Shellness, Kent." P. Malac. Soc., ii., 134.

Similar notes on same page by Crouch (from Cricksea and River Crouch) and Kennard (from Herne Bay).

Cooper, J. E.—"The new British Mollusc." Sci. Goss., 1896, 147.

Crouch, W. E.—See Cooper.

Dall, W. H.—"Insular Landshell Faunas, especially as illustrated by the data obtained by Dr. G. Baur in the Galapagos Islands." P. Acad. Sci. Philad., 1896, 395-459, pl. xv.-xvii.

Opening with an account of previous researches on the Mollusca of the Galapagos Islands, Dr. Dall proceeds to discuss the knowledge we at present possess with regard to the habits and inter-island distribution of the species. The islands are divided into three groups—South-eastern containing 30, Central 24, and North-eastern 3 species. The total number of species and varieties found in the islands is 46, distributed in the following genera:—*Bulimulus* 34, *Trochomorphus* (?) 1, *Vitrea* 1, *Conulus* 1, *Pupa* 2, *Succinea* 4, *Leptinaria* 2, and *Helicina* 1. We have omitted from this reckoning such genera as *Siphonaria*, as we fail to perceive how they can be classified as "land shells;" indeed, many students will probably miss Dr. Dall's valuable notes (e.g., on the genus *Williamia*), owing to the misleading nature of the title of this paper.

Dr. Dall then proceeds to discuss the surface characters—especially of the *Bulimuli*—and concludes that the peculiar crenulation or wrinkling of the surface which "is correlated with aridity or alkalinity of environment, may be regarded as having been impressed upon species which first gained a foothold in the arid region, and as having persisted to some extent in their descendants when the latter succeeded in reaching the upper and more congenial zones of the islands."

Further, he compares the fauna of the Galapagos Islands with that of other oceanic and isolated localities, and incidentally raises a question which, unfortunately, he does not proceed to solve: namely, why the species of *Endodonta* with basal lamellae are confined to oceanic islands? Finally, a valuable summary of the fauna both systematic and anatomical is given; the following is described as new: *Bulimulus nesioticus*; and figures are given of other species. We have to congratulate Dr. Dall on the publication of what will be the standard work on these islands.

Dall, W. H.—"On the American species of *Cyrenoida*." *Nautilus*, x., 51-2.

One recent n. sp. (*C. floridana*, from Florida) and one n. sp. (*C. caloosaeensis*) from Pliocene of S. Florida.

Dollfus, A.—"Les plages de la Manche." *Feu. Jeun. Natural.*, An. xxvii., 14-16, 29-30, 2 pls.

Drake, Mrs. M.—"Notes on some [Marine] shells of Puget Sound." *Nautilus*, x., 68-70.

Fagot, Paul.—"Faune Malacologique terrestre et des eaux douces et saumâtres de l'Aude." *Boll. Soc. Sci. de l'Aude*, vii., 171-213.

Gamble, F. W.—"Notes on a Zoölogical Expedition to Valentia Island, co. Kerry." *Trans. Manchester Micro. Soc.*, 1895, 60-66.

Garstang, Walter.—"On the Aplacophorous Amphineura of the British Seas." *P. Malac. Soc.*, ii., 123-5, pl. x.

Records four species and gives figures of them.

Horsley, Rev. J. W.—"Note on *Helix hortensis* near Dover." *Journ. of Conch.*, viii., 251.

Horsley, Rev. J. W.—"The Mollusca of Plumstead Marshes." *Journ. of Conch.*, viii., 262.

Hurst, C. Herbert.—"Fauna of Belfast Lough." *Irish Nat.*, v., 271-2.

Ihering, Dr. H. von.—"Zur Kenntniss der Sudamerikanischen *Voluta* und ihrer Geschichte." *Nach. Malak. Ges.*, 1896, 93-9.

Contains some interesting criticisms on Lahille's paper: two n. sp. are described, namely, *V. quemadensis* and *V. ameghinoi*, both from the Tertiary of Patagonia and nearly related to *V. brasiliensis*, Sol.

Kennard, A. S.—See Cooper.

Kobelt, Dr. W.—"Die Mollusken-Fauna der Makaronesischen Inseln." *Jahrb. Nassauische Ver.*, xlix., 53-70.

Kobelt, Dr. W.—"Die Fauna der Galapagos." *Nach. Malak. Ges.*, 1896, 115-121.

Principally taken from Dall's paper.

Locard, A.—"Mollusques Testacés et Brachiopodes [du Campagne du 'Caudan']." *Ann. Univ. Lyon*, xxvi., 129-245, pl. v.-vi.
Several new species.

Margier, E.—"Un mollusque terrestre nouveau, pour la Faune Française, *Pupa mortilleti*, Stabile." *Feu. Jeun. Natural.*, An. xxvi., 240.

Margier, E.—"Nouvelle station de l'*Azeca monodonta*, Fol. et Berillon." *Feu. Jeun. Natural.*, An. xxvii., 36.

McDougall, G.—"Third Report on the land and freshwater shells of Perth,

- Louth and Clackmannan." Trans. Stirling N. H. and Arch. Soc., 1895-6, 140-2.
- Oldham, Chas.—" *Helix fusca* and *Ataca tidius* in Denbighshire." Journ. of Conch., viii., 251.
- Oldham, C.—"Slugs in the Goyt Valley." The Naturalist, 1896, 354.
- Pilsbry, H. A.—"Notes on some West American Chitons." Nautilus, x., 49-51.
Includes the description of *Trachydermon sharpii*, a new species from Unalashka.
- P[ilsbry], H. A.—"Mexican Land Shells." Nautilus, x., 59.
- Pilsbry, Henry A., and Rush, William H.—"List, with notes, of land and freshwater shells collected by Dr. W. H. Rush in Uruguay and Argentina." Nautilus, x., 76-81.
This list contains the names of several n. sp., descriptions of which are to shortly appear.
- P[ilsbry], H. A.—"*Choanopoma* (*Ctenopoma*) *bahamense*, Shutt., at Key West." Nautilus, x., 96.
- Rush, see Pilsbry.
- S., R. F.—"Review of Adams' British Land and Freshwater Shells." Irish Nat., v., 285-6.
Some critical notes.
- Sandberger, Prof. von.—"*Pisidium ovatum*, Clessin, ein rest der Fauna der Eiszeit im Schwarzwald." Verh. Naturw. Ver. Karlsruhe, xi., 344-5.
- Shopland, E. R.—"Some further additions to the list of shells collected at Aden in 1892-5, classified in accordance with the Paetel Catalogue." Journ. Bombay Nat. Hist. Soc., x., 503-4.
- Smith, Edgar A.—"A list of the Land and Freshwater Mollusca of Trinidad" (conclusion). Journ. of Conch., viii., 241-251.
Three new species of *Bulimulus* (*Drymaeus*).
- Smith, Edgar A.—"A list of the Land Shells of the Islands of Batchian, Ternate, and Gilolo." P. Malac. Soc., ii., 120-2, figs.
Three very useful lists recording 43 species from Batchian, 21 from Ternate, and 39 from Gilolo. Two species of *Planispira* (*Cristigibba*) are described as new and figured, one from Gilolo, the other from Batchian.
- Smith, H.—"Some Land Shells of Michigan." Nautilus, x., 84.
- Stearns, R. E. C.—"*Purpura lapillus*, var. *imbricata*." Nautilus, x., 85.
- Tregelles, G. F.—"The Marine Mollusca of Cornwall." Journ. of Conch., viii., 252-262.
- Welch, R.—"Marine Mollusca of County Galway." Irish Nat., v., 274.
- Welch, R.—"Mollusca of Cavan Excursion." Irish Nat., v., 274.
- Winkley, Rev. Henry W.—"Casco Bay." Nautilus, x., 73-5.
Notes on land and marine collecting in Maine.
- See also:—In I., Ancey, Dautzenberg, Melvill, Pilsbry, Sykes, Wagner.

V. COLLECTING AND METHODS OF RESEARCH.

- Feltgen, Dr. E.—"Mollusken Terminologie. 'Fauna.'" Soc. Nat. Limb., 1896, 35-42, 59-63, 71-4, 94-8, 112-6, 137-45, 151-7.
- Johnson, C. W.—"Editorial Correspondence [relating to Museums of England]." Nautilus, x., 53-6.
- Johnson, C. W.—"Some notes on the Collection of Shells in the Museums of Paris, Berlin, and Amsterdam." Nautilus, x., 61-3.

VI. ECONOMICS.

Dedekind, Alexander.—"Recherches sur la pourpre *Oxybatta* chez les Assyriens et les Egyptiens." Arch. Zoöl. Exper., iv., 481-516, pl. xi.

Lacaze-Duthiers, H. de.—"Note sur la couleur de la pourpre tirée des Mollusques." Arch. Zoöl. Exper., iv., 471-480.

Thorne, R. T., Bulstrode, H. T., and Klein, Dr.—"Oyster Culture in relation to Disease." 24th Ann. Rep. Local Govt. Board, 1894-5, Supplement 1895, pp. xxiii. and 174, pls. xvi.

Shows that oyster beds are contaminated, and that the germs causing Typhoid Fever and Cholera live for many days in the shells of oysters kept in tanks where the water is constantly changed.

VII. BIOGRAPHIES.

Henderson, John B., jun.—"Obituary—B. Schmacker." Nautilus, x., 72.

Roberts, S. Raymond.—"Henry D. Van Nostrand." Nautilus, x., 93-4.

Obituary: Died Oct. 8th, aged about 73.

NOTES.

Supposed New Varieties.—I am in favour of naming varieties, but it is decidedly objectionable to give the same name to more than one, or introduce as new those long ago described and named. I see on p. 37 a reference to *Limax maximus* var. *alba*, nov., L. E. Adams. If this is the albino form, it was named *megaspilus* in 1817, and is also the *candidus* of Lessona and Pollonera. And if it were not, the name *albus* could not be used, as it was employed in 1890 by Amstein for a variety which is not an albino. In the new "Collector's Manual," Mr. Adams also re-introduces some old forms. *Helix hortensis* v. *luteolabiata*, L. E. Ad., was first described by the writer, under the same name, in "Sci. Goss.," 1887, p. 67. *Limnaea stagnalis* m. *scalariforme*, ascribed to Taylor, was also first published, under the same name, by the writer in 1884. All this confusion appears to be due to the idea that what was not known to the members of the Conchological Society who compiled their official list of Land and Freshwater Mollusca has no existence. If Mr. Adams will spend a few weeks looking up the literature in one of the big London libraries, he will see how far this is from being the case!

Mesilla, N.M., Oct. 28, 1895.

T. D. A. COCKERELL.

To cook Snails.—"Snails à la Bourguignonne."—Snails fed on vine-leaves are the best, and should be brought in alive. Keep them without food for a few days, then put them into a bowl with a handful of bran and a little vinegar to remove the slime. Wash them in several waters and place them in a saucepan with a handful of salt and some cold water, a bunch of fennel and two bay-leaves. Cover the saucepan and cook them gently for five or six hours. Remove the shells and take out the gut, and again wash in cold water. Pound two or three anchovies, and when reduced to a paste add 4 oz. of fresh butter, six sprigs of parsley, six shalots and two cloves of garlic (parsley, shalots and garlic all finely minced), a pinch of salt, a pinch of white pepper, and two pinches of cayenne. Add to these, when well mixed, a small quantity of good gravy (made from veal, if possible). Mix well. Put a small quantity of this forcemeat into each shell, then replace the snail. Pour over it a little butter, and lay carefully on a tin and bake for 8 to 10 minutes in a hot oven. Serve very hot. The common garden snail is probably quite as good, although not so large.

FLORANCE STEPHENSON.

EDITOR'S NOTES.

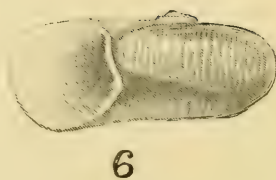
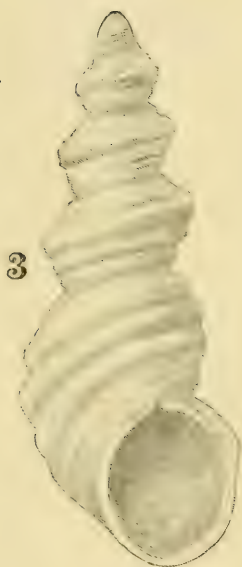
This number completes Volume V. of the JOURNAL OF MALACOLGY, and the Editor has pleasure in thanking the Editorial staff and the contributors generally for the work which they have done for the JOURNAL in the past year.

December 31st, 1896.

INDEX TO VOLUME V.

PAGES

ADAMS' Collector's Manual of British Land and Freshwater Shells (review of the second edition)	53
America, List of <i>Clausiliae</i> of South	57
Anatomy of <i>Chloritis (Sulcobasis) strephota</i> , E. A. Smith, and of <i>C. rehsei</i> , von Martens	33
BIBLIOGRAPHY (of Current Literature)	3, 21, 37, 60
Bibliography and Publication, Statement of the Committee of the British Association on	36
CHASTER, G. W., Some New Marine Mollusca from Tangier	1
<i>Chloritis (Sulcobasis) strephota</i> and <i>C. rehsei</i> , Anatomy of	33
<i>Charoia nigrofusca</i> , n. sp.	18
<i>Clausilia evae</i> , n. sp.	58
<i>Clausiliae</i> of South America	57
Cockerell, T. D. A., Supposed New Varieties	67
<i>Coecum cuspidatum</i> , n. sp.	2
<i>Corasia laurac</i> , Gude	51
<i>Cyclostrema fenestratum</i> , n. sp.	4
<i>Cyclostrema pruinosum</i> , n. sp.	3
<i>Cyclotus horridus</i>	20
GUINEA, Land Shells from New	17
<i>HELICINA pachystoma</i> , n. sp.	21
<i>Helicina solitaria</i>	22
KENNARD, A. S., Note on <i>Pterosoma plana</i> , Lesson	32
LAND Shells from New Guinea and other Neighbouring Islands	17
Lang's Text-book of Comparative Anatomy (review of Part II.)	27, 55
<i>MACROCHILAMYS papuana</i> , n. sp.	8
<i>Microcystina sappho</i>	18
Moss, William, and W. M. Webb, on the Anatomy of <i>Chloritis</i>	33
<i>NANINA infelix</i>	17
New Marine Mollusca from Tangier	1
New Species of Land Shells from New Guinea, etc.	17
Notes	32, 51, 67
Notes, Editor's	16, 32, 67
<i>OMPHALOTROPIS papuensis</i> , n. sp.	19
PACE, S., see Sykes, E. R.	—
<i>Papuina acrope</i> , <i>P. hero</i> , and <i>P. janthe</i>	17
<i>Pherusa carinata</i> , n. sp.	4
<i>Pterosoma plana</i> , Lesson, Note on	32
<i>Pupinella strubelli</i> , n. sp.	21
<i>RETROTORTINA fuscata</i> , n. gen. et sp.	2
Reviews	5, 7, 10, 24, 27, 52, 53, 55
<i>Rhysota hercules</i>	19
STEPHENSON, Florance, To Cook Snails	67
Sykes, E. R., List of <i>Clausiliae</i> of South America, with description of a New Species	57
Sykes, E. R., and S. Pace, Bibliography	5, 23, 37, 60
TANGIER, New Marine Mollusca from	1
Taylor's Monograph of British Land and Freshwater Mollusca (review of Part III.)	53
<i>Truncatella quadrasi</i> and <i>T. valida</i>	20
WEBB, W. M., and W. Moss, Anatomy of <i>Chloritis</i>	33
ZOOLOGICAL Bibliography and Publication, Statement of the Com- mittee of the British Association on	30

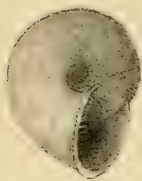


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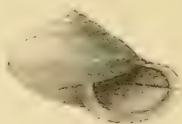
B. D. Rudd & Son sculpt.

- (1) *Cyclostrema fenestratum*. (2) *Cyclostrema fruosum*. (3) *Pherusa carinata*.
(4) *Cocculum cuspidatum*. (5 & 6) *Retrotortina fuscata*.

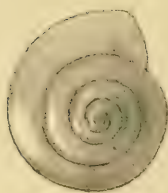
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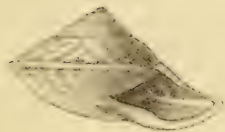
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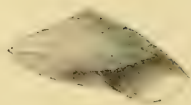
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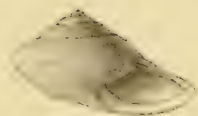
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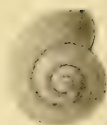
13



10



11



12



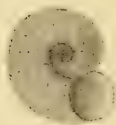
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15



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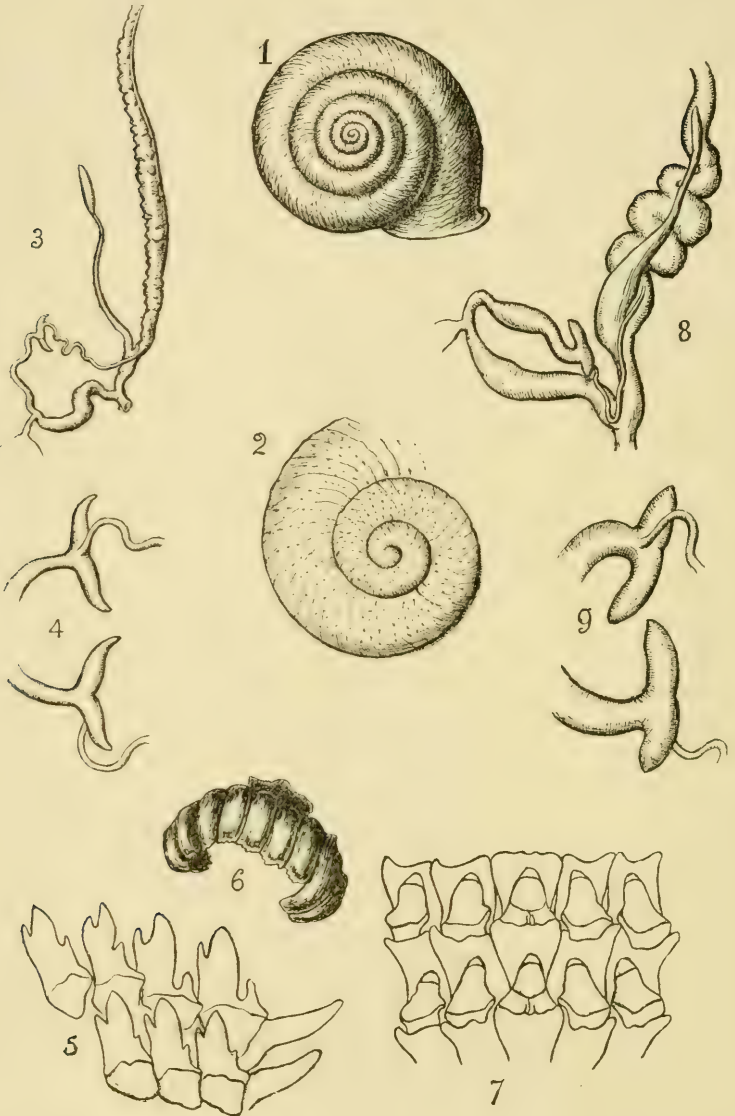
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19



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Ethel Webb del Figs. 5, 6, 7

Garratt & Walsh, sculpt.

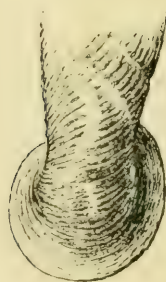
Chloritis (Sulcobasis) strophora and *C. rehsei*.



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Clausilia evae, n. sp.

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VOL. V. (No. 1.) CONTENTS. MARCH 25th, 1896.

							PAGE.
Some New Marine Mollusca from Tangier					George W. Chaster, M.R.C.S.		1
						(with Plate I.)	
Bibliography of Current Literature	..	..			E. R. Ruthven Sykes, B.A.,		
					F.Z.S., and S. Pace, F.Z.S.		5
REVIEWS	{	Species of <i>Amphidromus</i> , Fulton	..	..	..	..	5
		Manual of Conchology, Pilsbry	7
		New Data on <i>Spirula</i> , Dall	10
Editor's Notes	16

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Oceanic Deposits, Ancient and Modern, II., The Mollusca. By W. F. Hume	DECEMBER, p. 385
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The Swedish Marine Biological Station, with plate and text-figures. By F. A. Bather	DECEMBER, p. 407
The Use of Formalin as a Preservative Medium for Marine Animals. By James Hornell	DECEMBER, p. 416
The Speciesmonger in High Places	JANUARY, p. 4
Bibliography of Zoölogy and Bibliographic Innovations	JANUARY, p. 16
Review of Holt's "Examination of the Grimsby Trawl Fishery." By W. A. H.	JANUARY, p. 52
Review of Pilsbry's "Marine Mollusks of Japan"	JANUARY, p. 55
The Preliminary Notice	FEBRUARY, p. 73
The Origin of Slugs	FEBRUARY, p. 83
The Aptychus	FEBRUARY, p. 84
Casual Thoughts on Museums. III. Palaeontological Museums (referring specially to the Mollusca at the Natural History Museum), by Sir Henry Howorth	FEBRUARY, p. 114
The Association of Species	MARCH, p. 149
The Preservation of Marine Mollusca	MARCH, p. 152
The Hinge of Bivalve Shells	MARCH, p. 153
Concerning Snails	MARCH, p. 153
Review of Taylor's "Monograph of Land and Fresh-water Mollusca in the British Isles." By B. B. W.	MARCH, p. 203
Review of Journal of Malacology, Vol. IV.	MARCH, p. 207
Zoölogical Nomenclature. A Proposal	APRIL, p. 218
The Antarctic Fauna	APRIL, p. 222
On a proposed Classification of the Pelecypoda. By B. B. Woodward	APRIL, p. 239
Rules of Nomenclature in Zoölogy. By T. R. R. Stebbing and E. D. Cope	APRIL, p. 254

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VOL. V. (No. 2.)

CONTENTS.

JUNE 25th, 1896.

	PAGE.
On some Land Shells from New Guinea and other neighbouring Islands, with descriptions of New Species (<i>with Plate I.</i>)	Edgar A. Smith, F.Z.S. 17
Bibliography of Current Literature	E. R. Sykes, B.A., F.Z.S., and S. Pace, F.Z.S. 23
REVIEWS { Manual of Conchology, Pilsbry	24
{ Text-book of Comparative Anatomy, Lang	27
Note on <i>Pterosoma plana</i> , Lesson	A. S. Kennard 32
Editor's Notes	32

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Recent Contributions of Interest to Malacologists:—

Preserving Fluids for Molluscs	MAY,	p. 294
The Preliminary Notice	...	...	...	MAY,	p. 301
Priority in Nomenclature, and our Proposal	...	...	...	MAY,	p. 302
"Das Tierreich." A Criticism	...	...	...	MAY,	p. 305
Change in Zoological Nomenclature. By J. T. Cunningham	...	...	...	MAY,	p. 309
Review of Simroth's "Gastropoden der Plankton-Expedition." By W. E. H.	...	...	...	MAY,	p. 343
New Serials	...	...	...	MAY,	p. 349
			and	JUNE,	p. 418
The Meaning of Metamorphosis. By A. Hyatt and J. M. Arms	...	...	...	JUNE,	p. 395
Species-work as Educational Training...	...	...	...	JULY,	p. 1
An Ancient Octopod	...	...	...	JULY,	p. 16
The Dewey Decimal Classification and the International Catalogue of Science. By W. E. Hoyle and the Editor	...	...	...	JULY,	p. 43

Among other Contributors to Vol. VIII. may be mentioned J. ARTHUR THOMSON, C. DAVISON, W. A. HERDMAN, W. K. BROOKS, Sir HENRY HOWORTH, H. W. BURROWS, F. W. ANDREWES, T. R. R. STEBBING, G. H. CARPENTER, O. PICKARD-CAMBRIDGE, H. A. MACPHERSON, GEORGE MURRAY, J. B. FARMER, W. B. CLARK, E. B. WILSON, T. J. PARKER, A. FRITSCH, H. N. RIDLEY, B. B. WOODWARD, C. LLOYD MORGAN, BASHFORD DEAN, A. SMITH WOODWARD, E. RAY LANKESTER, T. T. GROOM, KARL PEARSON, KARL VON ZITTEL, T. GILL.

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VOL. V. (No. 3.)

CONTENTS.

SEPTEMBER 30th, 1896.

(Issued October 12th).

	PAGE.
On the Anatomy of <i>Chloritis (Sulcobasis) strophora</i> , E. A. Smith, and of <i>C. rehsei</i> , Von Martens..	By William Moss and Wilfred Mark Webb, F.L.S. 33
NOTICE—Statement of the Committee of the British Association or Zoölogical Bibliography and Publication	36
Bibliography of Current Literature	By E. R. Sykes, B.A., F.Z.S., and S. Pace, F.Z.S. 37
NOTE— <i>Corasia lauræ</i> , Gude	51
REVIEWS { Taylor's " Monograph of British Land and Freshwater Mollusca " ..	52
Adam's " Collector's Manual, British Land and Freshwater Shells " ..	53
Lang's " Text-Book of Comparative Anatomy "	55
	W. M. W.

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Recent Contributions of Interest to Malacologists:—

Preserving Fluids for Molluscs	MAY,	p. 294
The Preliminary Notice	...	...	...	MAY,	p. 301
Priority in Nomenclature, and our Proposal	...	...	...	MAY,	p. 302
"Das Tierreich." A Criticism	...	...	...	MAY,	p. 305
Change in Zoological Nomenclature. By J. T. Cunningham	...	...	...	MAY,	p. 309
Review of Simroth's "Gastropoden der Plankton-Expedition." By W. E. H.	...	...	...	MAY,	p. 343
New Serials	...	...	...	MAY,	p. 349
				and JUNE,	p. 418
The Meaning of Metamorphosis. By A. Hyatt and J. M. Arms	...	...	...	JUNE,	p. 395
Species-work as Educational Training...	...	...	...	JULY,	p. 1
An Ancient Octopod	...	...	...	JULY,	p. 16
The Dewey Decimal Classification and the International Catalogue of Science. By W. E. Hoyle and the Editor	...	...	...	JULY,	p. 43

Among other Contributors to Vol. VIII. may be mentioned J. ARTHUR THOMSON, C. DAVISON, W. A. HERDMAN, W. K. BROOKS, SIR HENRY HOWORTH, H. W. BURROWS, F. W. ANDREWES, T. R. R. STEBBING, G. H. CARPENTER, O. PICKARD-CAMBRIDGE, H. A. MACPHERSON, GEORGE MURRAY, J. B. FARMER, W. B. CLARK, E. B. WILSON, T. J. PARKER, A. FRITSCH, H. N. RIDLEY, B. B. WOODWARD, C. LLOYD MORGAN, BASHFORD DEAN, A. SMITH WOODWARD, E. RAY LANKESTER, T. T. GROOM, KARL PEARSON, KARL VON ZITTEL, T. GILL.

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VOL. V. (No. 4.)

CONTENTS.

DECEMBER 30th, 1896.

Rec'd Feb. 6th/97

(Issued December 31st.)

	PAGE.
List of the <i>Clausiliae</i> of South America, with the description of a New Species By E. R. Sykes, B.A., F.Z.S.	57
Bibliography of Current Literature By E. R. Sykes, B.A., F.Z.S., and S. Pace, F.Z.S.	60
NOTES { Supposed New Varieties By Professor T. D. A. Cockerell, F.Z.S.	67
{ To Cook Snails By Florence Stephenson	67
Editor's Notes	67
Index to Volume V.	68
Title Page and Contents of, and List of New Species described in Volume V. ..	

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Some Recent Contributions of Interest to Malacologists:—

Review of Joulin's "Cephalopods of the North Atlantic." By W. E. Hoyle	AUGUST,	p. 124
A Registry Office for Snails	...	...	...	SEPTEMBER,	p. 160
A Zoölogist in Tierra del Fuego. By Axel Ohlin (with 2 Maps)	...	...	...	"	p. 172
Paving-stone Palaeontology	...	...	...	NOVEMBER,	p. 283
The Preparation and Mounting of Chalk Fossils. By A. W. Rowe	...	...	...	"	p. 303
Review of Simroth's "Acéphalen der Plankton-Expedition"	...	...	...	"	p. 337
The Study of Variation	...	...	...	DECEMBER,	p. 346
British Snails	...	...	...	"	p. 348
The Hinge of Bivalve Molluscs	...	...	...	"	p. 358
List of Specialists Prepared to Determine Fossils	...	...	...	"	p. 361
Review of Wheelton Hind's "Monograph on <i>Carbonicola</i> , etc."	...	...	...	"	p. 386
Dr. Wheelton Hind's Reply to our Review	...	...	...	JANUARY,	p. 69
A Revision of North American Slugs (Editorial)	...	...	...	"	p. 10
Had the Belémnite an Aptychus?	"	p. 11
Wanted, a British Freshwater Biological Station. By D. J. Scurfield	"	p. 17

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CONTENTS OF VOLUME VI.

	PAGES
On the Anatomy of <i>Bulimus sinistorsus</i> , Deshayes (Plate I.) William Moss and Wilfred Mark Webb, F.L.S.	1
A few Notes on Slugs .. Professor T. D. A. Cockerell, F.Z.S.	3
On the specific name of <i>Helix ericetorum</i> Müller .. A. Santer Kennard	6
Some Observations on Certain Species of <i>Arion</i> (Plate II.) Walter E. Collinge, F.Z.S.	7
Books Received	11, 29, 39
Notes	15, 43
Some Sciagraphs of Shells (Plate III.) .. Wilfred Mark Webb Supplement to No. 1, follows page	16
Notes on <i>Helix nemoralis</i> , Linné, and <i>Helix hortensis</i> , Müller Rev. J. W. Horsley, M.A.	17
Note on the <i>Clausiliae</i> recorded from Celebes, with descriptions of New Species E. Ruthven Sykes, B.A., F.Z.S.	23
The British Species of <i>Testacella</i> —continued (Distribution) Wilfred Mark Webb, F.L.S.	25
Description of a New Species of Land Shell from Colombia Edgar A. Smith, F.Z.S.	27
On the Specific Name of <i>Hellicella ericetorum</i> Müller (With a Note by A. S. Kennard) Edgar A. Smith, F.Z.S.	28
Editor's Notes	32
On some New Species of Land Shells from the Island of Socotra (Plate V. frontispiece) Edgar A. Smith, F.Z.S.	33
Species of <i>Plectophyllis</i> recently described in "Science Gossip" by G. K. Gude	44
The British Species of <i>Testacella</i> , continued—Distribution and Reproductive System (Pl. VI.) Wilfred Mark Webb, F.L.S.	49
The Distribution of British Non-Marine Mollusca, I. Hand List for Essex	57
List of Species described for the first time in this volume ..	next page.
Index to this Volume	60

NEW SPECIES DESCRIBED IN VOLUME VI.

			Page.	Plate.	Figures.
<i>Clausilia pyrrha</i>	...	...	23	IV.	1 & 2
<i>Clausilia makassarensis</i>	...	...	23	IV.	3-6
<i>Labyrinthus assimilans</i>	...	...	27	IV.	7-9
<i>Ennea cylindracea</i>	...	...	34	V.	1
<i>Buliminus (Passamaiella) mirabilis</i>	...	...	34	V.	2
<i>Buliminus (Passamaiella) bentii</i>	...	...	35	V.	3
<i>Buliminus (Passamaiella) rotundus</i>	...	...	35	V.	4
<i>Buliminus (Ovella) acutus</i>	...	...	36	V.	5
<i>Buliminus (Ovella) innocens</i>	...	...	36	V.	6
<i>Stenogyra insculpta</i>	...	...	37	V.	7
<i>Stenogyra (Riebeckea) decipiens</i>	37		
<i>Auricula socotrensis</i>	37	V.	8-8b
<i>Lithididion bentii</i>	38	V.	9-9b

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No. 2.

JULY, 1897.

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NOTES ON *HELIX NEMORALIS*, LINNE,
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*Rector of St. Peter's, Walworth, and Chairman of the London Branch of
the Conchological Society.*

It was disgust that made me a student of snails. Not the affected disgust of a young woman when she discovers a beautiful and interesting specimen of *Arion ater* upon the rose she has unnecessarily plucked; but the disgust at myself, a naturalist by heredity and by environment and education from my earliest years, when I found by the inspection of a collection of British land shells made by a young friend that I had poked about hedges and ditches, woods and cliffs, for thirty out of the forty years I had lived, and yet had never noticed shells so striking in colour and variation as *Helix nemoralis*. I set to work at once to remedy this defect in my character as a general observer of nature, and at first collected only *nemoralis* and *hortensis*. Soon, however, this led me to help the collections of others and to form one for myself by gathering all the British land and freshwater molluscs. And then I cast my eyes abroad that I might better learn how to see at home, and laid the foundation of what is now a fairly large collection of the Helicidae of the world. The path that proved so pleasant to me is one on which I have induced the feet of not a few lads and men to tread, and with beginners I have always directed their attention first to these two *Helices*, so striking and so common.

To display my collection of the varieties and variations of *nemoralis* and *hortensis* is always to excite astonishment, and frequently to incite people to do and to possess likewise. A few notes, therefore, on these allied shells may be of interest to those who have not directed any special attention to their peculiarities.

First, let me utter a British growl, a grammarian's grumble, anent the absurdity or the misleading character of some of the scientific names we must encounter. *Helix nemoralis*, the snail of the groves, need never be pursued in the grove when there is a hedge handy, and especially is it abundant on sand-hills by the sea, which are about as diverse from groves as anything can be. When the broken shells of *nemoralis* are found in a wood, it may generally be discovered that they have been brought in from outside by some thrush, and that few living specimens can be found in the wood itself, except where they have entered beech woods for the purpose, so dear to them at certain times of the year, of ascending the smooth boles of the beech. Such *nemora nemoralis* are, according to my observation, usually of the nature of copses or plantations, and the deeper the wood the less the chance of finding *nemoralis* therein. Nor is the accuracy of the term *Helix hortensis*, the garden snail, much greater. I can only recall one garden, at Trentham, in which I have found it abundantly.

The hedge-row snail would be a better name, and *H. aspersa* might by the general acclamation and execration of all gardeners become the real *hortensis*. Nor are one's growls hushed when some of the varietal names are noted. Who was the maniac who called first the yellow bandless variety of *nemoralis*, *libellula*? The word is as unknown to classical Latin, as classical Latin is usually unknown to those who libel and ill-treat specimens by the so-called scientific names they give them. There is, indeed, *libella*, which means an ass, two-thirds of the truth concerning the sponsor of the shell. In the Latin of Natural History, however, *Libellula* means but a dragon fly. Were the dragon-flies which the author of the name had seen, uniformly bright yellow? Or did he find in their strongly reticulated wings, their enormous eyes, their powerful flight, and their carnivorous habits, the points of similarity to the shell which caused him to make the names identical? Then the red unicolourous and unbanded variety is called *rubella*. This in somewhat late Latin means reddish, but why is *rubra* not used? Its hue is definite

enough, and needs no term implying qualification or indecision. And the corresponding variety in *hortensis* is *incarnata*. To classical Latin this word is unknown: in mediaeval Latin it would, of course, be common, as meaning having become flesh. What was running in the namer's substitute for a mind was apparently the idea of flesh-coloured, and the fancy that *incarnatus* referred to a tint, and not an operation or a state. From cherry-red to pink, grade the hues of both *rubella* and *incarnata*, and *rubra* would exactly and accurately describe both. And then the yellow grounded, transparent banded variety of *hortensis* is, if you please, called *arenicola*, or the denizen of the sands! For myself, I have never found *hortensis* of any variety on one of the sand-hills I have searched, and I never found any one who could guess why this name was supposed to be appropriate. I did indeed once find on the Deal dunes or Sandwich sand-hills one or two of the corresponding variety of *nemoralis*—i.e., *hyalozonata*; and as this was (like all the forms of *nemoralis* I have seen that have no pigment-producing power for their bands) not black-lipped, I might, if unobservant and foolish enough, have taken it for *hortensis*, and have called it *arenicola*, though dozens of other varieties abounded in the same position, and would be equally entitled to the name. I suppose the namer of *arenicola* has long become *humicola*, and we cannot interrogate him as to what he might be pleased to call his reason for giving this name. Peace, therefore, to his hashes!

Is it really impossible for British conchologists to determine on the common adoption of an intelligible nomenclature, and, considering how undoubtedly allied are the two species, *nemoralis* and *hortensis*, to adopt the term *lutea* for what is called *libellula* in one and *lutea* in the other; *rubra* for what is *rubella* in one and *incarnata* in the other; and *hyalozonata* for the *hyalozonata* of *nemoralis* and the *arenicola* of *hortensis*?†

I pass on to give a few notes on the differences between *nemoralis* and *hortensis*, which, by the consent of the majority of

* Does not this, like all of the colour variations dignified with the mis-applied title of varieties, shade into its fellows, and may not this be the real reason of the qualifying name?—ED.

† Or perhaps if the suggestion made by Mr. B. B. Woodward in "The Zoölogist" (Nov., 1885, "On some variations in *Helix arbustorum*, Linn.), of simply using the "terms, yellow, red or white variations" and phrases such as, "with transparent bands" and so on, in conjunction with the band formulae, was followed, the difficulty would be met.—ED.

conchologists, are distinct species, although M. Souverbie, Curator of the Bordeaux Museum, waxed very vehement when discussing the matter with me, and maintained they were only varieties.

Others, in earlier days, maintained that the two species were so allied that there was a hybrid form, which form we should now call simply *H. hortensis* var. *fuscolabiata*. I have never seen *nemoralis* and *hortensis* pairing, although I have carefully looked out for instances, nor have I met any one who has. This is a strong argument for their diversity, although an occasional pairing would not prove them to be the same species.

The second difference is an anatomical one, the obvious and unvarying difference between the darts of the two species. That of *nemoralis* is straight and very like the Roman short sword; that of *hortensis* is curved. The length of the dart in *nemoralis* is 7-8 mm.; that of *hortensis* only 4 mm. The observation of the dart is of especial value when a form is found with white peristome and transparent bands associated with undoubted *nemoralis*. Is it a stray *arenicola*? or is it the much rarer *hyalozonata* form of *nemoralis*? The shells tell you little; the darts leave you no doubt. In fact, as *nemoralis* var. *albolabiata* is so rare in most places, it is always well to verify it by an examination of the dart.

The size of the two shells varies—*nemoralis* is usually $16\frac{1}{2}$ millimetres in height and $22\frac{1}{2}$ in breadth, and *hortensis* 16 mm. in height and 18 mm. in breadth, and generally the former is more variable in size than the latter. My largest *nemoralis* is 32 mm. in breadth, and my smallest *hortensis* 11 mm. The difference I have especially noticed abroad, where *nemoralis* is often much larger than the average size in England, but *hortensis* remains the same. A third point to be noticed is that it is not usual, though by no means unknown, for the two species to be found in the same habitat. I can only say, in mentally reviewing the very many localities in which I have noticed or gathered thousands of these shells, that I can recollect a hedge here and a bank there where both were found mixed and in fairly equal proportions. Even where both are found in the same lane, one may be exclusively found at one end and the other at the other. It seems to me, also, that *nemoralis* is more dependent than its cousin, or *hortensis* less dependent than

nemoralis, on a calcareous soil. And in a district where both are found *nemoralis* will affect the parts where the chalk or limestone comes to the surface, and *hortensis* will be in the hedges of the valley where alluvial soil to some extent covers the calcareous rock. Have conchologists noticed, by-the-bye, that in many places both these shells are common in wayside hedges and on the sides of high roads, but far less common in hedges a field or so distant from the road? One might have thought that the less amount of cover and the greater amount of enemies to be found close to the roads in comparison with field hedges would have reversed the position of affairs. But it seems to me that the dust of the high road provides lime so conveniently comminuted for the building up of their shells that they have been drawn, so to speak, into public life by its advantages.

Both shells being in their typical form five-banded, one may notice that the bandless or unicolourous varieties are much more common in *hortensis* than in *nemoralis*, one observer finding that 52·52 of the *hortensis* and only 17·86 of the *nemoralis* he collected in one district in Middlesex were of the bandless kind. This one might expect from the fact that *hortensis* is, on the whole, feebler than its cousin, and so more likely to be without pigment-producing powers, and this is borne out by the rarity of the translucent-banded forms in *nemoralis* and their comparative frequency in *hortensis*; and also by the variety with only a peripheral band being quite common in *nemoralis*, but distinctly rare in *hortensis*. But one must note *per contra*, and contrary to one's expectation, that the variety (sometimes called *coalita*) in which from excess of pigment power all the bands are united into one broad belt of chocolate colour that occupies nearly the whole whorl, is much more common in the weaker *hortensis* than in the sturdy *nemoralis*.

Other differences are these: The albino form is not uncommon in *hortensis*, though one may notice that the dead white appearance of the shell gives way to a white tinged with yellow when the animal is extracted; but in *nemoralis* there is hardly a really albino form, the name var. *pallida* being more justified than that of var. *albina*. The variety *lilacina*, again—a tint, by-the-bye, very rare in other Helicidae—is doubtfully found in *nemoralis*, though abundant in certain localities for *hortensis*. Nor are the two species at all alike as to unicolourous specimens of a brown colour. In *nemoralis* we have the vars. *castanea* and *olivacea*,

not rare and giving us many shades, from a dark ruddy brown to a light yellowish brown; but in *hortensis* the corresponding var. *fusca* is rare, and there is nothing like the series of shades of brown to be found.

Another point of difference is the prevalent ground colour. Looking at *nemoralis* in quantity, and including both banded and unbanded varieties, one would certainly come to the conclusion that the original type was red, whereas in *hortensis* yellow is the prevailing colour. The percentages of *nemoralis* were found by Mr. Belt, of Ealing, to be, at any rate for his neighbourhood, 37 per cent. yellow, 51 red, and 12 brown; while those of *hortensis* from the same district were 86 per cent. yellow, 14 red, and 0 brown.

Another point of difference seems to be that the colour of the peristome and columella is normal in *nemoralis* and accidental in *hortensis*, and collectors will notice that it is much more fugitive in *hortensis* than in *nemoralis*, so that the varieties of the latter shell with dark red, pink, or yellow lips should be protected from the light, and even then may be found to lose the colour of their peristome.

No doubt some of these differences are not of very conclusive force when used singly as arguments for the species being only allied and not one, but the cumulative force they possess when considered all together is by no means small.

Nemoralis is probably the older shell of the two, being found not only sub-fossil, but actually in Miocene strata, while I am not aware that a similar antiquity can be claimed for *hortensis*. It might, therefore, be held that *hortensis* is but a weak offshoot from *nemoralis*, or a more northern form. My own observations, however, in Central and Southern France and in Switzerland would not lead me to this conclusion.

NOTE ON THE CLAUSILIAE RECORDED FROM CELEBES WITH DESCRIPTIONS OF TWO NEW SPECIES.

By E. R. SYKES, B.A., F.Z.S.

The two species I now describe were collected by Mr. Doherty and placed in my hands by Mr. Fulton. With them was found a third form, which appears to me to be probably only a variety of *C. simillima*, Smith; dwarf in size (alt. 18, lat. 3.2 mill.; alt. apert. 3.8, lat. apert. 3 mill.), with finer striae, and the crenulation at the sutures almost absent.

Clausilia pyrrha n. sp. (Plate IV., Figures 1 and 2).

Testa elongata, solidula, rufo-cornea, nitidula, spira sub-attenuata, apice obtusulo, distorto; anfr. $9\frac{1}{2}$ -10, modice accrescentes, convexiusculi, primi laeves, reliqui sub lente dense sed obsolete striati, ultimus basi sub-inflatus, productus; sutura simplex; apertura obliqua, ovato-piriformis, basi recedens, intus rufo-cornea; peristoma incrassatum, sub-reflexum, solutum; lamella superior obliqua, marginalis, mediocris; lamella inferior fere marginalis, mediocris, spiraliter contorta, abrupte ascendens; lamella sub-columellaris marginalis, conspicua; plicae palatales duae, suturae parallae, una (principalis) mediocris, altera pygmæa. Alt. 17, lat. 3.3 mill.; alt. apert. 3.3, lat. apert. 2.25 mill.

Hab.—Between Maros and Tjamba, near Makassar, S. Celebes (Doherty).

In the position of the mouth this species recalls *C. subpolita*, Smith; but it is larger, more elongate, and differs in colouration; it is also thicker.

Clausilia makassarensis n. sp. (Plate IV., Figures 4-6).

Testa sub-elongata, tenuiuscula, obsolete striata, cornea, nitida, apice obtusulo; anfr. 9, modice accrescentes, plano-convexi; sutura simplex; apertura ovalis, basi paullo recedens, intus cornea; peristoma incrassatum, sub-reflexum, solutum; lamella superior obliqua, marginalis, l. inferior, mediocris, rapide ascendens, lamella sub-columellaris, sub-conspicua; plicae palatales duae suturae parallelae, p. principalis major, mediocris, altera parva. Alt. 13.7, lat. 3 mill.; alt. apert. 2.8, lat. apert. 2 mill.

Hab.—Between Maros and Tjamba, near Makassar, S. Celebes (Doherty).

An interesting little species re-calling *C. subpolita*, Smith,

but the shell is slightly more solid, the mouth more ovate and not nearly so oblique, the lamella inferior not so strongly twisted spirally, but more rapidly ascending into the shell.

I have also what I take to be a small variety of this species measuring alt. 12.2, lat. 2.9 mill.; alt. apert. 2.9, lat. apert. 2 mill. (Plate IV., Figures 5 and 6).

In this form the lamella sub-columellaris is almost obsolete, as is also the smaller palatal plica, and the mouth is more quadrate. It was collected with the type and will, I think, prove to be only a variety and not a distinct species.

The species recorded from Celebes appear to be as follows:

C. cumingiana, Pfr., var. *moluccensis* von Martens.
N. and S. Celebes.

C. celebensis, Smith. Bonthain Peak, 5000 to 6000 ft.

C. simillima, Smith. S. Celebes, 2000 ft.

C. subpolita, Smith. S. Celebes, 2000 ft.

C. usitata, Smith. S. Celebes, 2000 ft.

C. celebensis, Boettger. Balante, E. Celebes.

C. alternata, Moellendorff. Bua Kraeng.

C. makassarensis, n. sp., near Makassar.

C. pyrrha, n. sp., near Makassar.

Inasmuch as there are two apparently distinct species both published under the name of *celebensis*, it becomes material to ascertain which has the priority in date.

Mr. Smith's species appeared* on July 25th, 1896. Dr. Boettger's species appeared in a paper by Dr. Kobelt entitled "Schnecken von N. O. Celebes and Banggai,"† without, it may be remarked, any figure. This publication bears at its foot the date "27th June, 1896," and this is, one would suppose, the date of publication. An enquiry in April, 1897, however, from Messrs. Friedländer, whose name appears on the title-page as publishers, yields the following:—"No. 5 was published in October, 1896 (see our 'Naturae Novitates, 1896, nr. 20.')"‡

The date on the publication, therefore, appears to be that either of reading, or of distribution of reprints, and the note in the *Nachrichtsblatt* † that "Die Clausilie wird vor der gleichnamigen Smithschen Art wohl einige Tage Priorität haben" is inaccurate.

In such a state of affairs Dr. Boettger's species requires a new name, and I would propose that of *balantensis*.

* Proc. Malac. Soc., vol. ii., p. 99, pl. VII., fig. 24.

† Abh. Zööl. Mus. Dresden, 1896-97, Nr. 5.

‡ Nach. Malak. Gesell., 1896, p. 111.

THE BRITISH SPECIES OF TESTACELLA.

By WILFRED MARK WEBB, F.L.S.,

Assistant Biologist to the Essex County Council.

[Continued from volume iv., page 76.]

IN a previous paper dealing with the distinctive characters of our three species of worm-eating slugs, the writer expressed his intention of following out the distribution of these forms in the British Isles, and more particularly of the true *Testacella haliotidea*: it is intended to give here, a provisional list of localities from which the writer has received undoubted specimens of the last species, together with some records supplementing those given by Mr. Taylor* for *T. scutulum*, and a few for *T. maugei*.

Testacella haliotidea, Draparnaud.

Devonshire. The Castle, Tiverton (Captain L. Moore).

Kent. Shoreham Vicarage, Sevenoaks (Rev. R. Ashingdon Bullen).

Surrey. Nutfield Priory, with *T. scutulum* (J. Moffat). This is the only locality from which more than one species has been received. Mr. J. Scarlett, of Tasburgh, near Norwich, who told the writer of this locality, remembered the occurrence of worm-eating slugs at Nutfield 15 or 16 years ago. They were most plentiful in asparagus beds.

Surrey House, Leatherhead (C. A. Brigg, M.A.).

11, Harrow Road, East Dorking (C. J. Howell).

Kew Gardens (the Writer).

Essex. Widford Lodge, Widford (E. Hammond).

A dozen specimens were found 18 inches below the surface in a bed 9 feet in diameter on a lawn.

Stisted (Basil F. May).

Colchester (W. Patterson).

The specimens from the last two localities approached *T. scutulum* in colour.

Suffolk. Dallinghoo Rectory (Rev. R. Ashingdon Bullen).

Norfolk. Diddington Hall, Brandon (A. Tanner).

One very dark-coloured specimen.

Worcestershire. Worcester (J. Lloyd Bozward), Elmfield.

London Road, Worcester (C. H. Webber).

Hagley Hall, Stourbridge (D. R. Dixon).

Cheshire. Arley Hall, Northwich (J. V. Smith).

Yorkshire. Sandbeck Park, Rotherham, in Trent drainage (Geo. Summers).

Walk-upon-Dearne, 12 miles from the last locality, in "Don drainage" (W. McKeigh Jones).

Stirlingshire. Brentham Park, Stirling (David Bruce).

* Journal of Conchology, 1888, p. 337.

Testacella scutulum, Sowerby.

Surrey. Nutfield Priory, with *T. haliotidea* (J. Moffat).

Crescent Wood House, Sydenham Hill (John Prince).

Essex. Buckhurst Hill (W. Cole).

Hertfordshire. Chase Side, Enfield, known here for 30 years (F. Wright).

Hemel Hempstead Nursery, abundant (William Foden).

Middlesex. Brook Green, Hammersmith, and West Kensington, in gardens (the Writer).

Worton Hall Gardens, Isleworth, not common (A. Pentney),

Two specimens that when found "had between them a worm, of which each slug had swallowed an extremity."

Leicestershire. Belvoir Castle, Grantham (W. H. Divers).

Mr. Taylor gives this locality.

Yorkshire. The Gardens, Castle Howard, York, in large numbers (J. Riddell).

The Gardens, Woodleigh Hessele (Fred. Mason).

Gleastone Hall, Skipton (J. Jopkinson).

Mr. D. R. Dixon, of Stourbridge, who told the writer of this locality, found them there in 1868 or 9.

The Nurseries, Scarborough (Walshaw and Son).

Lincolnshire. High Park Gardens, Stamford (D. Metcalfe).

Testacella maugei, Férussac.

Cornwall. Trehone, Probus, four miles east of Truro (Captain Pinwell).

Rosehill, Falmouth (Howard Fox).

Dorsetshire. The Vicarage Garden, Corfe Castle (J. C. Mansel-Pleydell*).

Hampshire. Porchester (Alex. Goldney Headley).

Gloucestershire. Stoke Gifford, Bristol (George Summers).

Mr. Summers writes as follows:—"This is the place which I remember seeing them when a youth at home 30 years ago in the nurseries of Messrs. Maule and Sons (they are now dead, and with them the nurseries disappeared). My father was foreman with them for upwards of 50 years, and is now (1895) nearly 80 years of age; he writes to me that about 50 years ago a doctor in London advertised for some specimens of the worm-eating slug and offered a guinea a dozen for them. A friend of his (who is still alive and living near to him), who was living in South Wales, where they were plentiful, sent the doctor four dozen as a sample, which rather surprised him, and he wanted to pay a less price, but the late Mr. Maule interceded, and his friend was paid the money."

Glamorganshire. Wind-or Place, Cardiff, at the bottoms of carnation pots (Arthur Pike).

Dublin. Royal Botanic Gardens, Glasnevin (F. W. Moore and Dr. Scharff).

In conclusion, the writer must express his gratitude to the many correspondents who have contributed towards the making of the present list, which, with their further help, he hopes to make more complete at a later date.

* Specimens are figured by Mr. Mansel-Pleydell from Corfe Castle in a privately printed pamphlet, "*Testacella*, Cuvier."

DESCRIPTION OF A NEW SPECIES OF LAND SHELL FROM COLOMBIA.

By EDGAR A. SMITH, F.Z.S.

THE British Museum is indebted to Mr. S. J. Da Costa for two specimens of this very interesting species, which in several respects is very similar to the *Helix bogotensis* of Pfeiffer. The geographical distribution of the two forms is, as might be expected, also different, the latter occurring in the neighbourhood of Santa Fé de Bogota, and the present species to the north-west, near the Cauca River.

Labyrinthus assimilans, n. sp. (Plate IV., Figures 6-8).

Testa depressa, orbicularis, profunde umbilicata, rufo-fusca, lineis incrementi obliquis curvatis sculpta, undique plus minus tenuiter granulata; spira depressa conoidea, ad apicem obtusa; anfractus $4\frac{1}{2}$ celeriter accrescentes, leviter convexiusculi, ultimus ad peripheriam angulatus vel obtuse carinatus, infra medium convexus, antice ad aperturam subito deflexus, pone labrum contractus et scrobiculatus; apertura transverse auriformis; peristoma continuum, album, undique solutum et expansum, margine *supero* arcuato, intus tuberculo obtuso munito, *parietali* flexuoso, laminam validam prominentem emittente, *basali* obliquo, rectiusculo, intus tuberculis duobus inaequalibus munito, *dextro* dentibus duobus inaequalibus, in tuberculo elevato positis instructo. Diam. maj. 26 millim.; min. 22; alt. 12.

Habitat: Cauca River, Colombia.

In the form and armature of the aperture this species is almost identical with *L. bogotensis*, Pfeiffer, but it is easily distinguishable by its much smaller size and much more obtuse periphery. The peristome also is not so produced or pointed in front, the sinus between the tubercle within the upper margin and the large double tooth within the front margin being shallower and of a different form.

ON THE SPECIFIC NAME OF *HELICELLA* *ERICETORUM*, MUELLER.

By EDGAR A. SMITH, F.Z.S.

Under the above title, in the last number of this Journal, Mr. A. Santer Kennard has offered some observations respecting the identity of the species referred to, with the *Helix itala* of Linnaeus, and has called in question the accuracy of Mr. Hanley's decision in this matter.

Having known Mr. Hanley (who, I believe, is still living) for many years, and the extreme care which he was accustomed to bestow upon all his work, I felt sure that he could not have committed the mistake imputed to him by Mr. Kennard, namely, of misreading the number written upon the specimen of *Helix itala* in the Linnean cabinet. Mr. Hanley says that "the significant numerals" are "distinctly inscribed upon one of the specimens," but he does not quote the figures. His statement, however, is perfectly correct, for the number upon the shell, 598 (not 593, as given by Mr. Kennard) corresponds with that of the species in the 10th edition of the "Systema Naturae," tom. i., p. 772. Moreover, if Mr. Kennard had read the introduction to Mr. Hanley's work,* he would have discovered (p. 3) "that these numerals more frequently corresponded to the series of the tenth than of the twelfth edition." Mr. Kennard's mistake is obvious. He referred to the twelfth instead of the tenth edition of the Systema, the species in question being numbered 683 in the former.

Besides the gratification of testifying to my old friend's accuracy, I fully recognise the desirability of refuting Mr. Kennard's statement, which, uncontradicted, might tend to depreciate the great importance and utility of Mr. Hanley's work.

I am very much indebted to Mr. Smith for pointing out the very natural error into which I had fallen, but in my own defence I must say that the figures are very indistinct; consequently, it was easy to mistake 8 for 3, especially as I did not know what the figures should be. I did not refer to either the 10th or 12th edition. The Linnean number as given by Mr. Hanley for *Helix itala* was 683, and as this did not agree with the numerals on the shell, I concluded that an error had been made.—A. S. KENNARD.

* *Ipsa Linnaei Conchyliæ.*

BOOKS RECEIVED.

MANUAL OF CONCHOLOGY SECOND SERIES PULMONATA, part 41, by Henry A. Pilsbry, Philadelphia, pp. 1-64, pls. 1-13.

Mr. Pilsbry continues his work on the genus *Bulimulus* Leach, taking it up again at the second group of the three defined on p. 127 of Volume X., and distinguishing four subgenera, "although only the first of them stands conspicuously apart"; these are *Plectostylus*, Beck; *Scutalus*, Albers; *Bulimulus*, Leach; and *Rhinus*, Albers. The present part is chiefly occupied with the two first of these subgenera, and breaks off in the account of the South American species of *Bulimulus* proper.

THROUGH A POCKET LENS by Henry Scherren, F.Z.S., London, 1897, published by the Religious Tract Society, price 2s. 6d., 192 crown 8 vo. pages, and 90 illustrations.

Following a reasonable and customary method one might be tempted to quarrel with the title of this interesting little book and to suggest that a slight addition to it might have been an improvement. Had the work been called "Arthropods through a pocket lens" the "popular" sound would doubtless have been lost, as might also some readers who otherwise would have become interested in the animals so pleasingly described; but at the same time such a name would have given an idea of the contents of the book to others who already have an acquaintance with insects, centipedes, and crustaceans, and who desire to learn further details about them.



"Figure 15." *Dytiscus marginalis* (male).

Leaving the title-page behind, however, it may with certainty be said that books of this kind do much to foster and lead towards the study of the visible outcomes of life, that unborn spirit of curiosity upon which all scientific investigation depends. But just as a thirst for knowledge is a higher development of inquisitiveness, so may there be evolved from a magpie instinct of hoarding and pure love of possession, the desire of forming a collection of specimens for illustration and comparison in the systematic study of a special series of forms which is recognized as an important part of a naturalist's training. It is, therefore, with regret that one reads on page 25—"to make a collection of specimens in tubes would be waste of material." This looks rather like the throwing of collecting into the shade, though it must be said

that later on in the book, the suggestion is made that rare specimens should be sent to the National Collection at the British Museum.

The opening chapter contains much information that would be useful to beginners in any branch of Natural History and the remainder of the book is calculated to enable students of nature to spend many pleasant hours not only in working through the matters actually brought before them, but in examining the structure and looking into the habits of other animals on the lines laid down and suggested by Mr. Sherren.



"Figure 16." Shells of freshwater molluscs broken by *Dytiscus*.

[Figures 15 and 16 are reproduced through the courtesy of the Publishers.]

A point of interest to malacologists is the account of the way in which the water beetle *Dytiscus marginalis* ("Fig. 15.") preys upon freshwater molluscs and damages their shells ("Fig. 16.") in a way that has puzzled many who did not know who was the worker of such destruction. Mr. Sherren gave an explanation in the "Field" * but afterwards was obliged to yield up the credit † to Mr. G. B. Sowerby who, forty years before, had written an account of this habit of *Dytiscus marginalis* in his *Popular History of the Aquarium*. ‡

JOURNALS.

THE JOURNAL OF CONCHOLOGY, vol. viii., No. 12, July 1st, 1897.

Marshall, J. T.—"Additions to 'British Conchology,'" (cont.), pp. 388-95.

Wright, C. E.—"A colony of *Cucillioides acicula* Müll. in Northamptonshire," p. 395.

Melville, J. C. and Standen, Robert.—"Notes on a collection of shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with a list of species, part III." pp. 396-421.

Moss, W.—"A preliminary note on the genitalia of *Hyalinia* (*Zonitoides*) *nitida*, Müll., and *Hy. excavata* Bean.," p. 421.

Johnson, J. Yate.—"Description of *Helix watsoni*, n. sp., discovered at Madeira by Senhor J. M. Monez," pp. 429-430.

Marshall, J. T.—"The Marine Shells of Scilly," pp. 431-432.

* The "Field," April 4th, 1896. † The "Field," May 2, 1896. ‡ p. 288.

THE NAUTILUS, vol. xi., Nos. 1, 2, 3.

- Stearns, R. E. C.—“*Uvanilla regina*, a new locality,” p. 1.
- Dall, W. H.—“On a new form of *Polygyra* from New Mexico,” p. 2.
- Frierson, L. S.—“Conchological Notes from Louisiana,” p. 3.
- Wright, S. H.—“Contribution to a knowledge of United States Unionidae,” p. 4.
- Pilsbry, H. A.—“List of Molluscs collected in Maldonado Bay, Uruguay, by Dr. Wm. H. Rush, U.S.N.” pp. 6-9.
- Nylander, C. C.—“Freshwater Shells of the North East of Maine,” pp. 9-12.
- Simpson, C. T.—“*Helicina dysoni*,” pp. 13-14.
- Stearns, Robert E. C.—“Description of a new species of *Actaenon* from the Quarternary Bluffs of Spanish Bight, San Diego, California,” pp. 14-15.
- Cockerell, T. D. A.—“Notes of *Agriolimax*,” pp. 15-16.
- Ancey, C. F.—“Description of three new species of *Eulotae* (Helices) from Central Asia,” p. 16-17.
- New species, *Cathaica funki*; *Pseudiberus uniformis*; *Ps. anisopleurus*.
- Simpson, C. F.—Notes on the Classification of the Unios, pp. 18-23.
- Dall, W. H.—Synopsis of Pinnidae of the United States and West Indies,” pp. 25-26.
- Analy, C. F.—“On two so-called “*Bulimi*” from the New Hebrides,” pp. 26 and 27.
- “*B.*” *rupestris*, and “*B.*” *bernieri*: these are put in *Diplomorpha*.
- Aldrich, T. H.—“A new *Cancellaria* from the Alabama Eocene,” pp. 27-28, *Cancellaria lanceolata*.
- Baker, Frank, C.—“On a collection of Molluscs from Grand Tower, Illinois,” pp. 28-30.
- Pilsbry, H. A.—“*Helicina rabei*,” n. sp., p. 34.
- NACHRICHTSBLATT DE DEUTSCHEN MALAKOZOOLOGISCHEN GESELLSCHAFT, March and April, May and June, 1897.
- Kobelt, W.—“Diagnosen neuer Arten aus Kükenthals Ausbeute,” pp. 24-28.
- New species: *Helicarion kükenthali*, *Everettia moellendorffi*, *Vitrinoconus celebesianus*, *Dendrotrochus celebesianus*, *Raphanus kükenthali*, *Cyclotus* (*Pseudocyclophorus*) *curymphalus*, *Pupina* (*Siphonostyla*, sub-gen. nov.) *longituba*.
- Moellendorff, O. von.—“Drei neue Arten,” pp. 28-31.
- New species: *Plectophylis linterae* from Pegu, *Gonostoma* (*Drepanostoma*) *omphalospirum* from Hubei, *Papuina linterae*, New Guinea.
- Moellendorff, O. von.—“Diagnosen neuer und Kritischer Landdeckelsnecken,” pp. 31-41.
- Moellendorff, O. von.—“Neue Landschnecken von Java,” pp. 57-72.
- New species of *Helicarion*; *Sitalia*; *Kaliella*; *Lamprocystis*; *Aviophanta*; *Inozonites*; *Patula* (*Pyramidula*); *Acanthinula* (*Plectotropis*); *Chloritis*, *Buliminus*; *Boysidia*; *Hyphselostoma*; *Clausilia* and *Prosopeas*.
- Kobelt, W. and Moellendorff, O. von.—“Catalogue der gegenwärtig lebend bekannten Pneumonopomen,” p. 73-88.
- JOURNAL DE CONCHYLIOLOGIE, vol. xlv., Nos. 3 and 4.
- Bernard, Felix.—“Etudes comparatives sur la coquille des Lamellibranches *Condylocardia*, type nouveau de Lamellibranches,” pp. 169-207, pl. vi.
- Crosse, H.—“Note sur le genre *Pterosoma* de Lesson,” p. 207-213.
- Hidalgo, J. G.—“Observations sur quelques *Cochlostyla* des Philippines,” pp. 213-17.

- Hidalgo, J. G.—"Description d'une nouvelle espèce de *Cassis*," p. 217.
Cassis crossei from the Phillipine Isles.
- Crosse, H.—"Note sur la distribution géographique du *Cypraca achatidea* Gray (*C. physis* auct., non Broechi) dans la Méditerranée," p. 218-221, pl. vii.
- Dautzenberg, Ph.—"Description de deux espèces nouvelles de *Bulinus*," pp. 222-225, pl. vii.
Bulinulus (Goniostomus) bouvieri and *B. (Bostryx) moniezi*.
- Fischer, H.—"Note sur le bras hectocotylisé et sur le dimorphisme du sepien de *Sepia orbignyana*, Férussac," pp. 233-236, pl. viii.
- Hidalgo, J. G. "Catalogue des espèces du genre *Cochlostyla*, Férussac qui vivent dans les Iles Phillipines," pp. 237-353.
- Vayssiere, A.—"Description de deux espèces nouvelles de Pleurobranchidés," p. 353.
Pleurobranchus crossei and *P. giardi*.
- Mayer-Eymar, M. C. "Description de coquilles fossiles des terrains tertiaires inférieurs (suite)," pp. 356-368, pls: ix. and x.

THE IRISH NATURALIST, June and July, 1897.

- Adams, L. E. —"Land and Freshwater Mollusca of Ballycastle district," pp. 179-183.
- Chaster, G. W. —"Notes on the Marine Mollusca of Rathlin Island," pp. 184-187.

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SCIENCE GOSSIP, vol. iii., No. 36. Vol. iv., Nos. 37 and 38.

- Gude, G. K.—"Armature of Helicoid Landshells" (with new species and a new form of *Plectophylis*), vol. iii., p. 332; vol. ii., pp. 10-11 and 36-37. figs.
New species. *Plectophylis clathratuloides* and *P. muspratti*.
- Bowell, E. Wake.—"The Odontophores of Mollusca," vol. iv., p. 6, figs. of rows of "teeth" from various British Vitreas, etc.

KNOWLEDGE, May-July, 1897.

EDITOR'S NOTE.

The attention of readers is called to the notice that appears on the second page of the cover with reference to the forming of a complete record of the distribution of the land and freshwater Mollusca of the British Isles. It is hoped that a first instalment of revised County lists will appear in the next number of the JOURNAL.

THE JOURNAL OF MALACOLOGY.

No. I.

APRIL, 1897.

VOL. VI.

ON THE ANATOMY OF BULIMUS SINISTRORSUS, DESHAYES.

By WILLIAM MOSS and WILFRED MARK WEBB, F.L.S.

(PLATE I.)

In an article "On the generic position of *Bulinus galericulum*, Mouss.," contributed to the "Nautilus" for February last, Mr. Pilsbry points out that this species is the type of the section *Pseudopartula* of Pfeiffer, and he includes in the same section *Ariophanta dohertyi*, Ald., and *Helix nasuta*, Metc., leaving out "the New Caledonian species grouping around *B. sinistrorsus*, Desh.," placed in this position by Pfeiffer, and suggesting Montrouzier's name of *Draparnaudia* for them.

This grouping is based upon purely conchological characters, as Mr. Pilsbry is in doubt as to the systematic position of *Pseudopartula*, and says that "in the absence of information upon the soft anatomy, the group might be placed either next to *Papuina* in Helicidae, or in the Bulimulidae, or the Zonitidae."

As a contribution to the knowledge of the anatomy of one of the species originally included in *Pseudopartula*, the following brief notes on *B. sinistrorsus*, with the accompanying figures, are given as simple facts, no attempt being made by the writers to fix the place in classification, of either species or group.

The material for the present work, in the shape of several spirit specimens of *Bulinus sinistrorsus* was received by one of the writers (Mr. Moss) some years ago, through the kindness of Mr. and Mrs. Hadfield, who had collected the snails in Lifu, New Caledonia.

The remarks on the various organs made out, will be found under the heading of "Explanation of Plate I" on the following page.

EXPLANATION OF PLATE I.

Bulimus sinistrorsus, Deshayes, Lifu, New Caledonia.

FIGURE 1. The shell, three times the natural size.

FIGURE 2. The genitalia. In three specimens in which the spermatheca was dissected out, the shape of it was, as is shewn in this figure. Only the parts which remained unbroken have been sketched, but a fair-sized albumen gland is present, and the spermathecal sac is embedded in it, at the point of its attachment to the oviduct.

FIGURE 2A. A variation in the spermathecal duct, observed in one specimen.

FIGURE 3. The buccal mass (and its retractor muscle) slightly flattened, with the odontophore and radula shewn semi-diagrammatically through the wall. The oesophagus. Left salivary duct. The nerve collar (the cerebral and pedal ganglia of one side alone shew) and optic nerve supplying the left ommatophore. It may be pointed out that in *Bulimus sinistrorsus* the buccal mass cannot, apparently, be retracted through the nerve-collar.

FIGURE 4. The jaw. A long transparent projection runs backwards and upwards.

FIGURE 5. A median, the two adjacent and two marginal "teeth" from the radula.

FIGURE 6. The nerve collar, semi-diagrammatic. Only the nerves to the otocysts are shewn.

N.B.—All the figures are enlarged.

A FEW NOTES ON SLUGS.

By PROFESSOR D. T. A. COCKERELL, F.Z.S.

The following notes refer chiefly to a few matters which deserve further elucidation, but the writer is not now in a position to follow up the various lines of enquiry suggested by them.

AGRIOLIMAX.

- (1.) **A. laevis** (sens. lat.) in Bermuda. The "Challenger" expedition obtained a young *Agriolimax laevis* at Bermuda; it is in the British Museum, in the same bottle as some *Amalia gagates* from the same island. It is $13\frac{2}{3}$ mm. long; sole narrow, diam. $1\frac{1}{2}$ mm.; colour brownish-ochrey, slightly greyish dorsally, sole ochrey, unicolorous; mantle greyish with black marbling, except the margins and near them, which are pale ochre; neck grey above. Tail hardly keeled; mantle not visibly concentrically striate; respiratory orifice not *very* far behind the middle; median area of sole a little wider than either lateral area; longitudinal line of edge of sole about median between upper and lower margins of sole-edge. In general appearance, the slug recalls *A. berendti* var. *pictus*.
- (2.) **A. laevis** (sens. lat.) in Jamaica. I found this common at Moneague, in Jan., 1892; alive it was 16 mm. long, mantle 7 mm., all dark brown, slightly pale near mantle anteriorly, no obvious mottling; mantle with concentric lines; sole all pale grey, unicolorous. Mr. Fawcett sent me the same species from Cinchona; the specimens were 10 mm. long, grey-brown, not very dark, sole pale, unicolorous. Body above and mantle, minutely speckled with blackish; slime colourless. In alcohol they appear pale, and some are almost reticulate on the body. The shell is $2\frac{1}{3}$ mm. long, $1\frac{1}{2}$ broad, oval, but with the sides straight; nucleus on posterior edge, slightly to the left, concentric grooves visible but not strong, no sign of any ridge such as is in *berendti*, colour opaque white. Later,

Mr. Wm. Cradwick sent me many alive; they looked like *campestris*; in alcohol, all showed more or less mottling. Jaw bright-coloured, with a strong median projection.

It is possible that this slug is native in Jamaica, and that the Jamaica and Bermuda specimens may all represent a distinct West Indian race.

- (3.) *A. parasite* of *A. laevis* (s. lat.). In a specimen collected in 1889 by Mr. H. F. Wickham at Quincy, California, apparently referable to the form *hyperboreus*, Westerl., I found a small parasitic worm, believed to belong to the genus *Leptodera*.
- (4.) *A. berendti* var., *pictus*. This was figured by Mr. Binney from a specimen collected by Hemphill on the bank of the San Tomas River, Lower California. Length (in alcohol) about 10 mm., body paler than in var. *hemphilli*, inclined to be reticulate, mantle with black spots and blotches; shell squarish at ends, obscurely keeled as in *berendti*, growth-lines obscure. Penis-sac apparently as in *campestris*.
- (5.) *A. campestris* in New Mexico. Last year I found this slug on the Mescalero Indian Reservation, in the Sacramento Mts., just above the agency. This is the third locality recorded in New Mexico.

LIMAX.

- (6.) *L. maximus* in Madeira. The British Museum contains seven specimens from Madeira, two var. *cellarius* from Baron C. de Paiva, two var. *johnstoni* and two var. *moquini* from Mr. Mason, and one var. *cellarius* collected by Mr. L. M. Cockerell. There is also a *cellarius* from Lowe.
- (7.) *L. cinereoniger*, variety. A specimen collected by Mr. F. G. Fenn in August, 1890, at Echternach, Luxembourg (along with *Arion ater* var. *lamarckii* and *A. subfuscus* var. *rufofuscus*) agrees almost exactly with var. *stabilei*, Less., differing only in having the sides mottled with grey, instead of black, and the lateral areas of the sole grey instead of brownish; keel pale for about $\frac{2}{3}$ of the back. The var. *niger*, D. and M., is almost identical.

VERONICELLA.

(8.) *Veronicella* from Dominica. Length (in alch.) $17\frac{1}{2}$ mm., breadth $7\frac{1}{2}$, sole breadth 3 mm.; female orifice, 10 mm. from head, its inner edge almost overlapped by sole. The end of sole rounded, not projecting beyond body. Posterior orifice large, crescentic. Jaw dark, with about 20 ribs. Sole finely transversely striate, mantle punctate. Colour sub-olivaceous black, head and sole brown; a few light spots indicate the place of the dorsal line. Very similar to *V. langsdorfi*, but I expect it will prove to be a new species. The specimen described is in the British Museum.

(9.) *Veronicella* from Trinidad. Length about 27 mm., above, dark blackish-grey, faintly mottled with lighter colour, the mottling hardly visible without a lens; beneath, unicolorous, orchreous. Filiform glands short, and less than ten, so it can hardly be *V. caerulea*. Female orifice moderately distant from sole. Caparo, Trinidad (Mr. Urich). I think that it is very likely a new species.

AMALIA.

(10.) *A. gagates* subsp. *mediterranea*. Several specimens in the British Museum, collected by Dr. Anderson, at Hammam Meskontina, Algeria, must apparently be referred to this sub-species. They are not adult, but are very black; soles with the lateral areas pale, concolorous with the median area. The last character differs from strictly typical *mediterranea*.

MESILLA, NEW MEXICO, U.S.A.,
Feb. 6th, 1897.

ON THE SPECIFIC NAME OF *HELICELLA* *ERICETORUM*, MÜLLER.

By A. SANTER KENNARD.

It has been the custom of late with certain Malacologists, to adopt the name of "*itala* Linné" for the shell which is generally known as *Helicella ericetorum*, Müll. The authority given for this change, is the late Dr. Hanley, who, in his "*Ipsa Linnaei Conchylia*," adopted this course. It is there stated, pp. 371-2, as follows:—

"*Helix itala*, Linné. Having satisfied myself by the process of analysis so often alluded to, that no shell in the Linnean cabinet except the *Helix ericetorum* of authors (Chemnitz. Conch. Cab., Vol. ix., pl. 132, fig. 1192-1193), accurately coincided with the diagnosis of this species, I was agreeably surprised by discerning the significant numerals, fully and distinctly inscribed upon one of the specimens, for very rarely is any writing to be found on the smaller shells of the collection. Da Costa and Montagu had surmised the identity of that common British snail with the *itala* of Linnaeus." Of course, if Dr. Hanley's statement be correct, there is an end to the matter, and *itala* would stand.

In February last, through the kindness of Mr. J. E. Harting, F.L.S., I was enabled to examine Linné's specimens; and as a consequence of that examination, I am forced to disagree with Mr. Hanley as to the figures coinciding. If the shell is *H. itala*, the numbers should be 683, whereas they are 593. It is true they are rather indistinct, but with the aid of a lens they are easily deciphered, and I may add that Professor Herdman, Mr. R. Bullen Newton, Mr. W. M. Webb, and Mr. B. B. Woodward, who were present at the time, all agreed that the figures are 593. Of course, it is quite possible that the two species are identical, yet, as there is such a strong element of doubt in the matter, it is better to retain the name of *ericetorum*, Müll.

SOME OBSERVATIONS ON CERTAIN SPECIES OF ARION.

By WALTER E. COLLINGE, F.Z.S.

(Assistant-Lecturer and Demonstrator in Zoölogy and Comparative Anatomy,
Mason College, Birmingham.)

(PLATE II.)

I have recently received a large series of living examples of *A. ater*, L., *A. rufus*, L., *A. empiricorum*, Fér., and *A. lusitanicus*, Mabille, and knowing the very divided opinion that exists amongst malacologists as to the specific validity of these four forms, I have submitted them to a very careful examination, with the following results :—

1. *Arion ater*, Linné, 1746. (Pl. II., Fig. 1.)

Externally this species is very like *A. empiricorum*, Fér., the differences being very minute and unimportant. All the specimens I have seen, however, have been much larger than *A. empiricorum*; thus in twenty adult specimens, the length was as detailed below, the maximum being 125 millim., whereas of forty adult specimens of *A. empiricorum*, the maximum length was 118 millim.

<i>Arion ater</i> .			<i>Arion empiricorum</i> .		
5 Specimens	..	110-115 millim.	15 Specimens	..	80-90 millim.
8	„	120 „	12	„	90-100 „
7	„	125 „	10	„	115 „
			5	„	118 „

All the specimens were measured while alive. The internal differences in the form of the terminal portions of the generative organs are much more distinct. There is only a single vestibule—the lower one. The sperm-duct opens at the junction of the vestibule with the lower terminal swelling of the free-oviduct.

Its lower portion is characterised by a swelling which dilates into a globose sac (Pl. II., Fig. 1, *fov.*), and then is continued as a tube much narrower than in either *A. rufus*, L., or *A. empiricorum*, Fér. The vas deferens is sharply marked off from the sperm-duct, and is much shorter than in either of the two above-mentioned species. The free-oviduct is a very short, wide tube, little more than half the length of that organ in *A. rufus* or *A. empiricorum*, and is characterised by a large terminal swelling (Pl. II, Fig. 1). The receptaculum seminis is pyriform in shape, its duct is short, and widens out at its juncture with the vestibule. The retractor muscle is attached to the duct immediately below the expanded head, and joins that attached to the upper portion of the free-oviduct.

2. *Arion rufus*, Linné, 1758. (Pl. II, Fig. 2.)

There are two very distinct vestibules, the upper one being the larger. The sperm-duct shows a series of constrictions and usually* bends in the form of the letter L reversed, passing gradually into the vas deferens, a long, thin tube (Pl. II., Fig. 2). Sometimes, however, the sperm-duct and vas deferens are sharply marked off from each other. The free-oviduct is a moderately long tube of equal breadth throughout. The receptaculum seminis is large and ovoid in form, its duct is much longer than in *A. ater*, and about twice the length of that in *A. empiricorum* or *A. lusitanicus*. The retractor muscles are very similar to those in *A. ater*.

3. *Arion empiricorum*, Fér., 1819. (Pl. II., Fig. 3).

This is what is termed *A. ater* by British authors. There are two vestibules, the lower one being very short and the upper one large and wide, considerably larger than in *A. ater*. The sperm-duct is a large, wide tube; it exhibits no constrictions, and makes a sharp turn at the point where the vas deferens commences (Pl. II., Fig. 3). The free oviduct is a long, wide tube with its terminal portion expanded and forming part of the upper vestibule; unlike *A. ater*, it is not sharply constricted from the lower vestibule. The receptaculum seminis consists of a short, elongated sac and a very short duct (Pl. II., Fig. 3, *r.d.*). The duct is not more than half the length of that found in *A. ater* or *A. rufus*, but more nearly approaches the condition which

* In all the specimens I have examined this feature has been present.

obtains in *A. lusitanicus*, only the head is not so globose. The retractor muscle is attached to the duct just where it commences to expand to form the head. That attached to the free-oviduct is some little distance above this point, so that the muscles run in opposite directions, as shown in the figure (Pl. II., Fig. 3, *r.m.*).

Notwithstanding the minute differences in the form of the reproductive organs, pointed out by Pollonera,† I am inclined to agree, with Simroth, that the *A. sulcatus*, Morelet, is identical with *A. empiricorum*. The *A. hibernus*, Mabille, is also nothing more than a variety of *A. empiricorum*, differing from the typical form in its smaller size, more feeble rugae, and by the lighter colour of the foot-sole.

4. *Arion lusitanicus*, Mabille, 1868. (Pl. II., Fig. 4.)

Not a few malacologists have mistaken this species for *A. rufus*, *ater*, or *empiricorum*. Externally it is not unlike the last-mentioned species. Simroth‡, who has described and figured a series of young forms, mentions that the foot-sole is without the yellow slime and has an orange-coloured edge. Some young forms look not unlike *A. subfuscus*, Drap. The *A. dasilvae*, Pollonera, is regarded by Simroth as a variety of this species; at present, however, I prefer to keep it distinct. The *A. nobrei*, Poll., is, in my opinion, synonymous with *A. lusitanicus*. The only points of difference I find in the generative organs are that there is no sharp distinction between the sperm-duct and vas deferens, which are slightly shorter than in *A. lusitanicus*, the free-oviduct is more tapering and does not show the sharp bend so characteristic of *A. lusitanicus*. The retractor muscle of the receptaculum seminis is also shorter (Pl. II., Fig. 5). In *A. lusitanicus* the generative orifice leads into a large vestibule. The sperm-duct is long and tapering and sharply differentiated from the long vas deferens. The receptacular duct commences as a dilated tube, then narrows and expands terminally to form the receptaculum seminis, not unlike the condition which obtains in *A. ater*.§ To the receptacular duct a retractor muscle is attached, which blends with that attached to the lower portion of the free-oviduct. The free-oviduct is a short tube slightly bent upon itself, the lower portion being

† Bull. Mus. Zool. Torino, 1890, vol. v., no. 87.

‡ Nova. Acta. K.L.-C. Deutsch. Akad. Nat., Bd. lvi., Taf. 4.

§ Not *A. empiricorum*, Fér., as I, by an oversight, stated in a previous paper (Conchologist, 1893, vol. ii., pp. 113-17).

globose, the upper a short, narrow tube. The lower portion opens into the vestibule as a broad tube, thus differing very markedly from the condition seen in *A. empiricorum*. Sinroth || has figured and described the spermatophore, which also differs from that found in *A. empiricorum*.

From the above remarks, I think it will be seen that there is reliable evidence of important and constant internal differences between these four species.

|| Nova Acta K.L.-C. Deutsch. Akad. Nat., Bd. lvi., Taf. 6, Fig. 2.

EXPLANATION OF PLATE II.

- | | |
|---------|-----------------------------------------------------------------------|
| Fig. 1. | The terminal ducts of the generative organs of <i>Arion ater</i> , L. |
| Fig. 2. | The same of <i>A. rufus</i> , L. |
| Fig. 3. | " " <i>A. empiricorum</i> , Fér. |
| Fig. 4. | " " <i>A. lusitanicus</i> , Mab. |
| Fig. 5. | " " <i>A. nobrei</i> , Poll. |

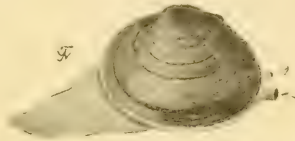
LETTERING.

<i>f.ov.</i>	Free-oviduct.
<i>l.v.</i>	Lower vestibule.
<i>ov.</i>	Oviduct.
<i>pr.</i>	Prostate.
<i>r.d.</i>	Receptacular duct.
<i>r.m.</i>	Retractor muscles.
<i>r.s.</i>	Receptaculum seminis.
<i>s.d.</i>	Sperm-duct.
<i>u.v.</i>	Upper vestibule.
<i>v.d.</i>	Vas deferens.

BOOKS RECEIVED.*

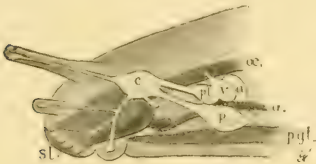
A MONOGRAPH OF THE LAND AND FRESHWATER MOLLUSCA OF THE
BRITISH ISLES. PART IV. By J. W. Taylor, F.L.S. Taylor
Bros., Leeds, pp. 193-256. Figs. 378-513.

The first fifteen pages of the present part complete the detailed "MORPHOLOGY OF THE EXTERNAL ORGANS" alluded to in our last review, by finishing an account of modifications of the foot and pedal glands, and by giving an exhaustive description of the mantle and body region, including a brief but clear explanation of visceral torsion.



"FIG. 385." *Sphaerium rivicola* (Leach) shewing the subreptatory burrowing or crawling foot.

The remainder of the part deals with the "INTERNAL ORGANIZATION" in a similar way, but does not complete it as was expected.† The nervous system is first described in great detail. We give two illustrations which (with others) have been kindly lent by the author (Figs. 424 and 425), that shew types of nerve collar which respectively do, and do not allow the passage of the buccal mass through them.



"FIG. 424." Semi-schematic view of the prosoma of *Limax*, shewing the arrangement of the ganglia, nerves and other organs, and their relation to the protrusible and retractile buccal bulb, X 3 (after Pelseneer).

a., abdominal ganglia; *c.*, cerebral ganglia, with the infero-posterior buccal ganglia, and also shewing nerve prolongations to the eyes, rhinophores, labial lobes, Semper's lobes, etc.; *oe.*, oesophagus; *p.*, pedal ganglia; *p.gl.*, pedal gla d; *pl.*, pleural ganglia; *s.l.*, Semper's lobes; *u.*, anterior aorta; *v.*, visceral or pallial ganglia.



"FIG. 425." The buccal bulb of *Succinea putris* (L), shewing the close constriction of the cerebro-visceral nerve ring around the oesophagus, cephalic retractors and salivary ducts owing to the shortening of the cerebro-pleural connectives which totally prevents the retraction of the buccal bulb through the nerve ring X 8, and organs.

Very many interesting facts are brought forward with regard to the powers of smell, vision and hearing; in fact, this portion of the work seems to be of a most useful nature, and tends to overcome our desire for the beginning of the systematic portion of the work.

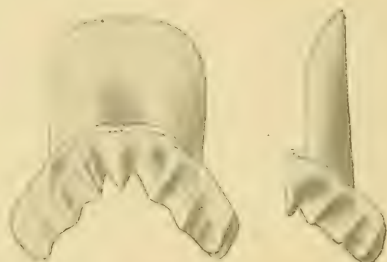
* For the present only books received by the Editor will be noted.

† See part I. of the Monograph, p. 2 of the cover.

After the completion of the account of the nervous system, the alimentary canal is discussed, and, after some generalities, a well-illustrated account of the variation in the jaw is given, and the subject of the odontophore entered upon.



"FIG. 513." Pleurognathous Quadimaxillate mandibles of *Cyclostoma elegans* (Müll.).



"FIGS. 512 and 513." Front and side view of appendiculate or Elasmognathous mandible of *Succinea putris* (L.).

The same remarks that we have previously made, will apply to the general style and get up of Part IV., and we look forward to the time when the whole work rests completed on our shelves.

W. M. W.

JOURNALS.

PROCEEDINGS OF THE MALACOLOGICAL SOCIETY, vol. ii., No. 4.

Sowerby, G. B.—"Three new shells," p. 137, pl. xi.,

Litorium armatum; *Pecten thomasi*; *Cardium mendanaense*.

Bednall, W. T.—"The Polyplacophora of South Australia," p. 139, pl. xii.

New species, *Ischnochiton pilsbryanus*, *I. pilsbryi*, *I. tateanus*, *I. thomasi*, *Chiton exoptandus*.

Murdoch, R.—"Descriptions of new species of *Endodonta* and *Flammulina* from New Zealand," p. 160, figs.

Melville, J. C. and Sykes, E. R.—"Notes on a collection of marine shells from the Andaman Isles with descriptions of new species," p. 164, p. xiii.

New species, *Pleurotoma booleyi*, *P. ochroleuca*, *Acilla booleyi*, *Mitra isomeres*, *Nassa eucomista*, *Turritella leptomita*.

Godwin, Austen H. H.—"Notes on the genus *Euplecta* of Semper with descriptions of supposed new species from Ceylon," p. 173, pl. xii. *Euplecta prestoni*; *Kaliella salicensis*; *Lamprocystis* (?) *sinhala*; *L.* (?) *nuwaraensis*.

THE JOURNAL OF CONCHOLOGY, vol. viii., Nos. 10 and 11.

Marshall, J. T.—"Additions to 'British Conchology,'" pp. 338 and 353.

Chaster, G. W.—"*Adeorbis unisulcatus*, n. sp., from the Irish Coast," p. 373.

Darbishire, R. D.—"A visit to a snail farm," p. 374.

Melville, J. C. and Standen, Robert—"Notes on a collection of Shells from Lifu and Uvea, Loyalty Islands." (Part II. continued) p. 379.

Taylor, J. W.—"On two remarkably atavic specimens of *Planorbis spirorbis*, Müll," p. 382.

THE NAUTILUS, vol. ix., Nos. 8, 9, 10 and 11.

1896.

Stearns, R. E. C.—“*Purpura lapillus*, var. *imbricata*,” p. 85.

Pilsbry, H. A.—“Notes on new species of Amnicolidæ collected by Dr. Rush in Uruguay,” p. 86.

New genus, *Potamolithus* and nine new species of the same.

Ancey, C. F.—“Descriptions of some new shells from the New Hebrides Archipelago,” p. 90.

New species, *Endodonta* (?) *tenuscripta*, *Melania vatensis* and *Neritina coccinea*.

Marsh, W. A.—“New American *Unio*,” p. 91. *Unio askewi*, plate I., figs. 1, 2 and 3.

1897.

Hanham, W.—“Notes on the Land Shells of Quebec City and District,” p. 98.

Pilsbry, H. A.—“New Lower California *Bulimuli*,” p. 102.

New species, *Bulimulus trypodon* and *B. lamellifer*.

Marsh, W. A.—“New American Unionidæ,” p. 103. Plate I., figs. 1, 3 and 4.

New species *Unio superiorensis*.

Ancey, C. F.—“On some Sinistral Land Shells,” p. 104.

Mayyck, W. G.—“*Cochlicella ventricosa*, Drap., near Charlestown, S.C.,” p. 105.

Pilsbry, H. A.—“On the generic position of *Bulimus galericulum*, Mouss,” p. 109.

Walker, Bryant—“*Planorbis nautilus*, L. in America,” p. 109.

Dall, W. H.—“List of species collected at Bahia, Brazil.” By Dr. H. Von Jhering, p. 121.

New species *Mactrella iheringi*.

NACHRICHTSBLATT DE DEUTSCHEN MALAKOZOOLOGISCHEN GESELLSCHAFT.

November and December, 1896, and January and February, 1897,

1896.

Moellendorff, Dr. O. von.—“Landschnecken von Celebes,” p. 133.

Many new species.

1897.

Moellendorff, Dr. O. von.—“Ueber *Trochonanina* und *Dendtrochus*,” p. 5.

Strubell, Bruno.—“Neue Süßwasser-conchylien aus Sumatra and Java,” p. 8.

Naegle, Pfarrer G.—“Einige neue syrische Land und Süßwasserschnecken,” p. 13.

Boettger, Prof. Dr. O.—“Neue *Helix*-Formen aus der Mainyer Tertiar,” p. 16.

JOURNAL DE CONCHYLIOLOGIE, vol. xlv., Nos. 1 and 2.

Hidalgo, G.—“Observations sur quelques *Cochlostyla* des Philippines,” p. 5.

Hidalgo, G.—“Sur l’habitat du *Cypraea aurantium* Marton ou *aurora* Solander,” p. 47.

Crosse, H.—“Additions à la Faune malacologique terrestre et fluviatile de la Nouvelle Calédonie et des ses dépendances,” p. 48.

Hervier, R. P. J.—“Descriptions d’espèces nouvelles de mollusques provenant d’l’Archipel de la Nouvelle Calédonie,” pp. 51 and 138., pls. i. ii. and iii.

Description of several new species of *Drillia*, *Clavus*, *Surcula*, *Glyphostoma* and *Daphnella*, and many of *Clathurella*.

Vayssiere, A.—"Descriptions de quelques espèces nouvelles ou peu connues de Pleurobranchidés," p. 113, pls. iv. and v.

New species *Berthella brocki*, *B. edwardsii*; *Pleurobranchus ferrieri*, *P. mobii*.

THE ESSEX NATURALIST, vol. x., Nos. 1-4.

Webb, Wilfred Mark.—"The Non-Marine Molluscs of Essex," pp. 27-48. (to be concluded).

THE IRISH NATURALIST, vol. iv., No. 12 and vol. vi., Nos. 1-4.

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Welch, R.—"*Helix arbustorum* in Co. Derry," vol. iv., p. 318.

Welch, R.—"*Helix fusca* in Co. Down," vol. v., p. 318.

THE NATURALIST, 1897, Nos. 258-261.

Roebuck, W. Denison.—"Land and Freshwater Mollusca," 1890-91 Bibliography, p. 27.

Taylor, John W.—"A probably new species of *Azeca* (*Azeca elongata*) in the British Isles," p. 75—see page 15 below.

Crowther, H.—"*Testacella scutulum* at Adel," p. 80.

SCIENCE GOSSIP, vol. iii., Nos. 31-35.

Gude, G. K.—"Armature of Helicoid Land Shells" (continued from p. 156) pp. 178, 204, 244, 274.

Plectophylis affinis, new species, p. 276.

Cockerell, T. D. A.—"Foreign varieties of British Land and Freshwater Mollusca," p. 262.

KNOWLEDGE, December, 1896, Jan.-April, 1897.

BULLETIN OF THE MICHIGAN FISH COMMISSION, No. 6.

Walker, Bryant.—"A Biological Examination of Lake Michigan, appendix V. The Mollusca," p. 96.

THE MUSEUM, vol. vii., Nos. 1-4.

Snyder, W. E. "Land and freshwater Shells of Dodge County, Wisconsin," p. 11.

ANNAES DE SCIENCIAS NATURAES, anno. iv. (1891) No. 1.

Nobre, Augusto "Mollusques et Brachiopodes du Portugal" (continued) p. 37.

REPRINTS.

From the INTERNATIONAL JOURNAL OF MICROSCOPY AND NATURAL SCIENCE, January, 1897.

French, John.—"Notes on *Gryphaea incurva*."

From the PROCEEDINGS OF UNITED STATES, NATIONAL MUSEUM, vol. xix.

Stanton, T. W.—"On the genus *Remondia*, Gabb, a group of Cretaceous bivalve molluscs," pp. 399, pl. xxvi.

Guppy, R. J. E. and Dall, W. A.—"Description of Tertiary fossils from the Antillean region," p. 303-331, plates xxvii-xxx.

Dall, W. H.—"Report on the Molluscs collected by the International Boundary Commission of the United States and Mexico, 1892-4," pp. 333-379, plates xxxi-xxviii.

PAMPHLET.

A LIST OF THE LAND AND FRESHWATER SHELLS FOUND AT SUTTON, COLDFIELD. By Albert Wood, Leeds, 1897.

NOTES.

Azeca elongata, Taylor. In "The Naturalist" for last March on pages 75 and 76, Mr. J. W. Taylor describes under this name "a probably new species of *Azeca*, in the British Isles." The description is based upon two shells, the first from North Wales and the second from Ingleton, Yorkshire, which differ from *Azeca tridens*, Pulteney, in having two and half more whorls

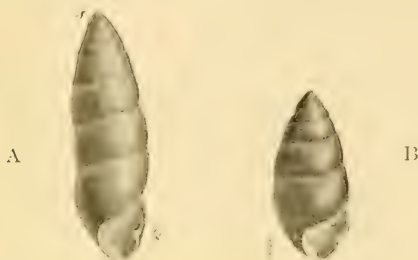


FIGURE 1. A, *Azeca elongata*, Taylor, Ingleton B, *Azeca tridens*, Pulteney,
Ikley, both x 4.

(that is $9\frac{1}{2}$ instead of 7) ; in the fact that these increase more slowly in size ; and that the last of them is comparatively smaller. The mouth also of the shell in *Azeca elongata* is different in shape, the denticle on the outer lip is stronger and there is no trace of the "winding columellar lamella which is so conspicuous a feature in *Azeca tridens*."

Through the courtesy of Mr. W. Denison Roebuck, the Editor of "The Naturalist" we are able to give the figures (Figure 1, A and B) of the new shell," and of *Azeca tridens* which illustrate Mr. Taylor's paper.

W. M. W.

The dates of Publication of the Journal de Conchyliologie.—Since a list of the dates of issue of some parts of this publication up to vol. xli., No. 2, was given in our pages * it has, we regret to say, gone on, in what we can only describe as its evil way. Numerous enquiries having reached us as to the real dates of issue of the various parts we think it may be of interest to supplement the former list by placing on record the dates at which a subscriber through an English publisher, received his copies. If our readers allow 14 days for the transit, &c., they will be easily able to arrive at the true dates of publication. Why the editors of a periodical of the high class nature of the "Journal de Conchyliologie" should proceed in such an extraordinary manner we fail to understand.

Part.	Date on cover.	Date of receipt.
Vol. xli., No. 3.	July, 1893.	March 24th, 1894.
" " 4.	October, 1893.	August 8th, 1894.
Vol. xlii., No. 1.	January, 1894.	November 10th, 1894.
" " 2.	April, 1894.	March 1st, 1895.
" " 3.	July, 1894.	November 1st, 1895.
" " 4.	October, 1894.	December, 1895.
Vol. xliii., No. 1.	January, 1895.	February 26th, 1895.
" " 2.	April, 1895.	April 27th, 1896.
" " 3.	July, 1895.	June 13th, 1896.
" " 4.	October, 1895.	September 12th, 1896.
Vol. xliv., No. 1.	January, 1896.	December 31st, 1896.
" " 2.	April, 1896.	April 20th, 1897.

* Journ. Malac. iii., p. 9.

E. R. S.

Some French methods of cooking Snails.—**Preparation.**—Snails are at their best during the winter as at other times they are apt to cause nausea, colic, or even worse ailments, unless they have been starved for a week. To do this keep them in a covered jar picking them over daily and rejecting dead ones. After a week's fasting they are nearly as good as in winter.

To remove the slime, put them into lukewarm water to which salt and vinegar have been added. Change the water three or four times, always adding salt and vinegar. Use cold water the last time. Be careful never to use boiling water, as often advised, as this kills them at once and removes but little slime.

After preparing the snails as described above they may be cooked in the various ways given under the following headings:—

Fried Snails.—Place the prepared snails in boiling water and leave them until they can be easily taken from the shells with a small fork *i.e.*, for about ten minutes. Then remove the gut and let them stand for some time in a marinade composed of equal quantities of water and vinegar, flavoured with minced parsley, garlic, shalot and onion, cloves, thyme, and a bay-leaf. Then drain them, dry on a cloth and fry in hot fat. Drain well on soft paper and serve with a garnish of fried parsley. They may be dipped into a frying butter if preferred, after being marinated.

Snails a la Poulette.—After taking the snails from their shells and removing the gut, put them into a saucepan with a good piece of butter and, if liked, some mushrooms. Mix a little flour with some white wine, stir in the saucepan, add a little salt, pepper, parsley, garlic and cloves to your taste. Stew until well reduced, when a little cream or the yolk of an egg may be added. Serve with a little minced parsley sprinkled over the stew.

Snails a la Parisienne.—This is, perhaps, the nicest way of serving snails.

After shelling them and removing the gut, replace the snails in the shells, filling up the opening with good butter which has been well mixed with very finely minced parsley and garlic. Arrange the shells in a shallow dish so that they cannot turn over and so let the butter escape. Cook for a short time in the oven and serve very hot.

Some persons prefer to leave the gut in the snail thinking it adds to the flavour, but this is a matter of opinion only and it is usually removed.

Stuffed Snails.—Make a force-meat of all or any of the following ingredients:—garlic, parsley, shalots, onions, sorrel, almonds, hazel-nuts, walnuts, sausage meat, anchovies, scraps of veal and cold fowl. These must all be minced very finely and worked well with a piece of good fresh butter.

Fill up the shells, after replacing the snails, with this mixture and cook in the oven as above.

Ragout of Snails.—After preparing them as before, put the snails into a saucepan with a pat of butter, salt, pepper, very small onions, mushrooms, a tiny bit of garlic, thyme, a bay leaf and half-a-glass of red or white wine. Cook gently for half-an-hour. A fowl's liver, cooked and pounded is a great improvement, if added at the last moment, and if white wine has been used a small quantity of madeira, cognac or vermouth, will enrich the gravy.

FLORANCE STEPHENSON.

THE
JOURNAL OF MALACOLOGY.

Nos. 3 & 4. SEPTEMBER & DECEMBER, 1897. Vol. VI.

ON SOME NEW SPECIES OF LAND SHELLS
FROM THE ISLAND OF SOCOTRA.

By EDGAR A. SMITH, F.Z.S.

(PLATE V.)

The most recent account of the terrestrial and freshwater Mollusca of the island of Socotra is that published by Mr. Crosse in the *Journal de Conchyliologie*, 1884, pp. 341-375. This catalogue enumerates all the species known up to that date, and is accompanied by references to the different works in which the species have been described, and some observations respecting the character and distribution of the fauna, and its relationship to that of neighbouring countries.

Since this catalogue appeared, nothing has been added to our knowledge of the Mollusca of the island. During the present year the British Museum has received from Mrs. Theodore Bent a series of land and freshwater shells collected by herself and her late husband whose devotion to exploration was unfortunately terminated by death. This collection contains the majority of the known species and several others new to science. The fact that as many as nine new forms were discovered by Mr. and Mrs. Bent would appear to indicate that many new species have yet to be found in unexplored parts of the island.

My colleague Mr. Ogilvie Grant and Lieutenant-Colonel Yerbury, both ardent and experienced collectors, who propose to visit Socotra next year will doubtless add considerably to our knowledge of the fauna. Therefore, until their return, I abstain from giving a full report upon the shells obtained by Mr. and Mrs. Bent, and merely offer descriptions of the new species which they discovered.

1. *Ennea cylindracea*, n. sp., (Pl. V., fig. 1).

Testa parva, angusta, cylindracea, imperforata, alba, pellucida; spira elongata, ad apicem mammillata; anfractus sex, lente accrescentes, primus globosus, tres sequentes convexiusculi, ult. et penult. planiusculi sutura profunda obliqua discreti, lineis incrementi tenuibus striati, ultimus antice subascendens, supra dorsum tenuiter costulato-striatus; apertura irregulariter subquadrata, parva, longit. totius $\frac{1}{4}$ adaequans, dente unica parietali instructa; peristoma leviter incrassatum, marginibus callo conspicuo junctis, exteriore versus suturam leviter sinuato, columellari dilatato, intus prominente, subplicato.

Longit. 7, diam. 2 mm. Apertura 1.6 longa, 1.25 lata.

2. *Buliminus (Passamaiella) mirabilis*, n. sp.,
(Pl. V., fig. 2).

Testa subglobosa, superne acuminata, purpureo-fusca, rimata, lineis incrementi tenuibus obliquis striata; spira conoidea, ad apicem submammillata; anfractus $5\frac{1}{2}$, superiores duo convexi, laeves, sequentes vix convexiusculi, ultimus magnus, globosus, postice leviter descendens, sed versus aperturam subascendens, fovea labrum foveam profundam exhibens, et infra rimam umbilicalem valde excavatus; apertura auriformis, longit. totius $\frac{1}{2}$ paulo superans; peristoma incrassatum, expansum, reflexum, livido-fuscum, marginibus callo plus minus crasso junctis, externo intus in medio tuberculo duplice albo valde prominente instructo, columellari plica crassa intrante alba armato.

Longit. 23, diam. 16 mm.

Distinguished by its globose form, colour, and the characters of the aperture. In form this species bears a striking resemblance to a shell from Fernando Noronha described by the author under the name of *Bulimus (Tomigerus) ramagei**, and the armature of the aperture although different, is of the same character.

B. isthmedon, Martens is smaller, differently coloured, and has a more oblique aperture and the sculpture appears to be rather coarser.

* Journ. Linn. Soc., vol. xx., p. 500, pl. xxx., fig. 8.

3. **Buliminus (Passamaiella) bentii**, n. sp.,
(Pl. V., fig. 3).

Testa irregulariter ovata, superne acuminata, albida ?, vel fuscescens, rimata, spira convexi conoidea, ad apicem obtuse mammillata; anfractus 5 subceleriter accrescentas, superiores duo convexi, laeves, sequentes duo minus convexi, peroblique striati, ultimus postice oblique descendens, sed prope labrum subascendens, pone labri medium et infra rimam umbilicalem valde impressus; apertura irregularis, obliqua, auriformis, contracta; peristoma paulo incrassatum, anguste expansum et reflexum, marginibus callo conspicuo recto sed obliquo fere junctis, externo intus in medio bituberculato et columellari plica valida elongata oblique intrante instructo.

Longit. 18.5, diam. 10 mm.

The only two specimens collected by Mr. and Mrs. Bent are in a bleached condition, exhibiting traces of a horny or brownish colour only towards the apex. The form of this very interesting species is very remarkable and at once distinguishes it from the other allied species. The great contraction of the aperture is very peculiar, it is also remarkable in that the parietal callus does not actually join the extremities of the peristome, but is separated both above and below by a slight notch or channel. It is a melancholy pleasure that one feels in associating this very curious species with the name of the late Mr. Bent.

4. **Buliminus (Passamaiella) rotundus**, n. sp.,
(Pl. V., fig. 4).

Testa globosus, superne conoidea, inferne excavata, vix rimata, albida; spira breviter conoidea, ad apicem submammillata; anfractus 5½ lente accrescentes, sutura mediocriter profunda sejuncti, duo superiores convexi, laeves, sequentes minus convexi, oblique tenuissime et confertim costulati, ultimus globosus, antice haud descendens, in regione umbilici excavatus, et circa excavationem antice obtuse carinatus, pone labrum profunde scrobiculatus; apertura irregulariter auriformis, contracta; peristoma album, tenue, marginibus callo conspicuo utrinque fere junctis, externo in medio intus projecto et bituberculato, columellari reflexo, plica gracile intrante instructo, ad insertionem canaliculato.

Longit. 13, diam. 11.5 mm.

Remarkable for its globular form, the fine costulation being finer than in *B. passamaianus*, the contracted, denticulate aperture, &c. The parietal callus is separated from the extremities of the peristome, both above and below, by a narrow groove or channel.

5. *Buliminus* (*Ovella*) *acutus*, n. sp. (Pl. V., fig. 5).

Testa ovato-fusiformis, anguste perforata, nitida, nigro-et fusco-cornea, strigis albis, longitudinalibus, angustis, irregularibus, infra medium anfr. ultimi subito, obliquis, ornata, lineis incrementi vix conspicuis sculpta; spira elongato-pyramidalis, ad apicem obtusa; anfractus 7 lente accrescentes, duo superiores flavescens convexi, cæteri planiusculi, ultimus haud descendens, antice subacuminatus; apertura anguste ovalis, intus saturate fusca, longit. totius $\frac{1}{3}$ paulo superans; peristoma flavescens, subtenue, margine externo haud expanso, columellari anguste reflexo, ad insertionem albo, intus in medio tenuiter uniplicato.

Longit. 13, diam. 5.4. mm. Apertura 5 longa, 2.5 lata.

The acuminate spire, flattened whorls and style of colouration are the distinguishing features of this pretty species. The ground colour of the last whorl is lighter than that of the two preceding whorls and besides the irregular white lines and stripes, a few white dots are scattered irregularly over the surface. The shell is very smooth and glossy, and the embryonic shell consists of two convex whorls of a yellowish horn colour. Allied to *B. longiformis*, Godwin-Austen, but smaller, with a more acuminate spire, and a peculiar style of markings on the lower half of the body-whorl.

6. *Buliminus* (*Ovella*) *innocens*, n. sp. (Pl. V., fig. 6).

Testa parva, angusta, ovato-fusiformis, rimata, albida; anfractus 7 lente accrescentes, apicales duo laeves, convexi, cæteri planiusculi, oblique confertim costulato-striati, sutura leviter obliqua distincta sejuncti, ultimus haud descendens; apertura parva, angusta, longit. totius $\frac{1}{3}$ paulo superans, alba; peristoma tenue, margine exteriore vix expanso, columellari leviter reflexo, intus plica obliqua tenui instructo.

Longit. 12, diam. 4 mm. Apertura 4 longa, 2 lata.

Only two dead specimens are in the collection which may be more or less bleached, but neither exhibit any traces of colour-makings. The species may be recognised by the slender form and very fine, close-set costulae,

7. *Stenogyra insculpta*, n. sp. (Pl. V., fig. 7).

Testa subulata, imperforata, alba; anfractus 15 lentissime accrescentes, sutura profunda obliqua discreti, duo apicales laeves, convexi, supra tabulati, apicem obtusum formantes, sequentes 5-6 convexiusculi, caeteri minus convexi, subplani, striis leviter obliquis confertis peculiariter crenulatis sculpti, ultimus ad peripheriam angulatus, haud descendens; apertura angulatim ovalis; peristoma tenue, simplex, margine columellari anguste reflexo.

Longit. 37, diam. 6 mm. Apertura 5 longa, 3 lata.

This species is remarkable for the peculiar sculpture, consisting of close-set slightly oblique raised lines of growth, which, being crossed by numerous transverse impressed striae, have a prettily festooned or crenulated appearance. It differs from *S. arguta* Martens in sculpture, in the angulation of the body-whorl, and more tapering form.

8. *Stenogyra (Riebeckia) decipiens*, n. sp.

Testa S. socotoranae similis, sed ad apicem magis attenuata, sutura haud canaliculata, sculptura tenuiore, haud cancellata.

Longit. 88 mm., diam. 30. Apertura 27 longa.

„ 78 „ „ 25. „ 22 „

Although quite similar in general appearance, this species is certainly distinct from *S. socotorana*. The top of the spire is more slender, the suture is not deeply cut or channelled, and the sculpturi is much finer, consisting of fine lines of growth and excessively fine spiral striae. It is possible that some of the shells figured by Martens (Conch. Mittheil, vol. ii., pl. xxix) may belong to this species, figs. 7a, 7b, and 8 especially having a very striking resemblance to it.

9. *Auricula socotrensis*, n. sp. (Pl. V., figs. 8, 8A).

Testa elongato-ovata, imperforata, olivaceo-fusca, nitida, lineis incrementi tenuibus striata; spira brevis, convexe conoidea, ad apicem mammillata; anfractus 7, supremus convexus, caeteri vix convexi, interdum plus minus spiraliter punctati, ultimus elongatus, lateribus leviter convexus; apertura inverse elongato-auriformis; labrum tenue, intus levissime incrassatum; columella quadriplicata, plicis superioribus duobus subconjunctis et aliis inferioribus solidioribus.

Longit. 9, diam. 4 mm. Apertura 7 longa.

Allied to *A. pusilla*, H. & A. Adams, *A. newillii*, and *gassiesi* of Morelet and a few other species, but quite distinct.

10. *Lithidion bentii*, n. sp. (Pl. V., figs. 9-9b.)

Testa discoidea, apertissime umbilicata, acute carinata alba, vel supra pallide rufescens, leviter nitens; spira plana; anfractus quinque, apicales duo (protoconcha) laeves, perconvexi, cacteri liris quatuor spiralibus gracilibus supra instructi, convexiusculi, hic illic radiatim subplicati, ultimus ad peripheriam carina compressa acute ornatus, infra liris concentricis 4-5 circumdatus; apertura rotundata, intus rufescens; peristoma album, marginibus callo junctis, margine supero sursum dilatato, inferiore incrassato, vix reflexo.

Diam. maj. 13, min. 11, alt. 3 mm.

Much flatter than *L. marmorosum* G.-Austen, with a much more prominent peripheral keel.

EXPLANATION OF THE FIGURES ON PLATE V.

- | | |
|------------|-------------------------------------------------|
| Fig. 1. | <i>Ennea cylindracea.</i> |
| Fig. 2. | <i>Buliminus (Passamaiaella) mirabilis.</i> |
| Fig. 3. | <i>Buliminus (Passamaiaella) bentii.</i> |
| Fig. 4. | <i>Buliminus (Passamaiaella) rotundus.</i> |
| Fig. 5. | <i>Buliminus (Ovella) acutus.</i> |
| Fig. 6. | <i>Buliminus (Ovella) innocens.</i> |
| Fig. 7. | <i>Stenogyra insculpta.</i> |
| Fig. 8. | <i>Auricula socotrensis.</i> |
| Fig. 8a. | <i>Auricula socotrensis.</i> Aperture enlarged. |
| Fig. 9-9b. | <i>Lithidion bentii.</i> |

BOOKS RECEIVED.

MANUAL OF CONCHOLOGY, SECOND SERIES, PULMONATA, part 42, by Henry
A. Pilsby, Philadelphia, pp. 55-144, pls. 14-25.

In this instalment, the section *Bulimus* proper, is brought to a finish. *Rhinus* is also completed, while a fifth section *Hyperaulax* (created by Mr. Pilsby in 1897 for *B. ridleyi*, E. A. Smith) is added to the four (given *ante*, p. 29), into which Mr. Pilsby breaks up his second division of the genus *Bulimulus*, or those species "with nepeonic whorls sculptured with waved, zig-zag, or irregular subvertical wrinkles, or with the wrinkles dislocated and broken more or less into granules or a netted pattern." Furthermore, the third division, in which the sculpturing of the nepeonic whorls is regular, is attacked—the forms belonging to the division are geographically and by general appearance divided into sub-genera, viz.—*Protyglyptus* from Eastern and Northern America, Trinidad, etc., *Naesiotes* from the Galapagos Islands, and *Orthotomum* from Central and Northern Mexico, Lower California, and Southern United States. The work on the first is finished, and the present part breaks off during the consideration of *Orthotomum*.

JOURNALS.

PROCEEDINGS OF THE MALACOLOGICAL SOCIETY OF LONDON, vol. ii., parts
6 and 7 (1897.)

Tate, Ralph.—"On a recent species of *Arcoferna*," pp. 181-2, fig.

Arcoferna recens, n. sp.

Suter, Henry.—"Revision of the New Zealand Polyplacophora," pp. 183-200 fig.

Suter, Henry.—"Note on *Mitra obscura*," Hutton, p.p. 201-2, fig.

Howes, G. B.—Presidential Address, pp. 203-226. A most masterly account of the Malacological work of the year.

Gwatkin, H. M.—"The Dentition of the Pupidae," p. 227,

Confirms Dr Sterki's discovery that *Vertigo edentula* has the dentition of a *Punctum*.

Smith, Edgar A.—"Notes on some type-specimens in the British Museum," p. 229-232.

Murex penchinata, Crosse, is *M. hultoniae*, Wright; *M. fourrieri*, Crosse, is a variety of *M. emarginatus*, Sowerby; *Cancellaria souverbiana*, Crosse, is *C. crenifera*; *Mitra crowani*, Crosse, is *M. conica*.

Sykes, E. R.—"Descriptions of some new species of Helicoid and operculate land shells from Ceylon," pp. 235-257, pl. xvi.

New species:—*Corilla colletti*, *C. gudei*; *Euplecta colletti*, *E. scobinoides*; *Polita notabiles*; *Macrochlamys? circumsculpta*; *Cyathopoma artatum*, *C. prestoni*, *C. turbinatum*; *Diplommatina (Nidica) prestoni*.

Kennard, A. S., and Woodward, B. B.—"The Mollusca of the English Cave Deposits," pp. 242-244, figs.

This interesting paper deals chiefly with the Mollusca found in Ightham fissure in Kent, the species of greatest interest being:—*Hygromia umbrosa*, Partsch, which has not previously been discovered living or fossil in this country; *Vitrea helvetica* Blum (*glabra*, Brit. Auct.), which has not been found fossil before; *Pomatias elegans* and *Vitrea alliaria* found in Pleistocene deposits for the first time (the statement that these occur in the Holocenes of Essex must only be meant to apply to the first shell as *V. alliaria* has not been found fossil in Essex at all); *Limax maximus* and *Clausilia laminata* are new records for our Pleistocenes; *Succinea oblonga* and *Vertigo minutissima*. A slender variation of *Carychium minimum* is figured.

Suter, Henry.—"A revision of the New Zealand Athoracophoridae," pp. 245-257, figs.

New species:—*Athoracophorus dendyi* (*Janella maculata*, Collinge, is *Athoracophorus bitentaculatus*, Quoy and Gaimard).

Suter, Henry.—"The Land Mollusca of Stewart Island," pp. 268-9. Eleven fresh species.

Suter, Henry.—"Revision of the New Zealand Trochidae," p.p. 260-283, figs.

New species:—*Gibbula micans*.

Suter, Henry.—"Notes on some New Zealand *Flammulina*, with the description of *F. ponsonbyi*, n.sp.," pp. 284-5, figs.

Smith, Edgar A.—"Descriptions of New species of Land Shells from New Guinea and neighbouring islands," p. 286-290, pl. xviii.

New species:—*Rhytida trobriandensis*; *Macrochlamys dohertyi*; *Ariophanta (Hemiplecta) andaientis*; *Chlorites fusco-purpurea*; *Papuina rufo-purpurea*, *P. molesta*; *Pupina papuana*; *Truncatella gracilentia*.

Melville, J. Cosmo, and Ponsonby, J. H.—"Description of *Achatina studleyi*, n.p., from Old Calabar, West Africa," p. 291, fig.

Melville, J. Cosmo.—"Description of *Plecotrema syhesi*, n.sp., from Karachi," p. 292, fig.

Collinge, Walter E.—"On a further Collection of Slugs from the Hawaiian (or Sandwich) Islands," pp. 203-397, figs.

New species:—*Amalia babori*.

Sykes, E. R.—"Diagnoses of New Non-Marine Mollusca from the Hawaiian Islands," p. 298-9. New species of *Vitrea*, *Kalliela* and *Succinea*.

THE JOURNAL OF CONCHOLOGY, vol. viii., No. 13, October 1st, 1897.

Marshall, J. T.—"The Marine Shells of Scilly" (concluded) p. 433.

Oldham, Charles.—"*Limax cinereo-niger*, Wolff, in Derbyshire," p. 433.

Melville, J. Cosmo.—"Upon the Principles of Nomenclature and their application to the Genera of Recent Mollusca," pp. 435-479.

A most interesting account of the various pre-Linnean authors, and discussion of the various codes of nomenclature that have been drawn up, from time to time, as well as of many other points.

THE NAUTILUS.—Vol. xi., Nos. 5, 6, 7, & 8.

Wood, M. Williard.—"Bolinas, California; the Conchologists' Paradise," pp. 49-54.

Pilsbry, Henry A.—"Note on a Californian *Helix*," pp. 54-55.

Wright, Berlin H.—"New Unios," pp. 55-6.

New species:—*Unio buxtoni* and *U. suttoni*.

Dall, W. H.—"New land shells from Mexico and New Mexico," pp. 61-2.

New species:—*Holospira* (*Haplostemma*) *cockerelli*; *Coelocentrum atropheres*; *Schazicheila hidalgoana*.

Ancey, C. T.—"On two new species of *Amphridomus*," p. 62-3.

Amphidromus fultoni, from Cochin China, and *A. eudeli*, from Annam.

Merrian, John C.—"New species of tertiary Mollusca from Vancouver Island," p.p. 94-65.

Cythera newcombei, *C. vancouverensis*, *Patella geometrica*; *Turritella diveri-lineata*; *Nassa newcombei*; *Bullia buccinoides*.

Dall, W. H.—"New species of Mexican land shells," pp. 73-74.

Helix (*Lysinoe*) *queretaroana*; *H. (L.) sebastiana*; *Polygyra nelsoni*.

Hemphill, Henry.—"Description of a new variety of land shell from Idaho," p. 74 and 75.

Helix devia var. *clappi*.

Cockerell, T. D. A.—"Notes on slugs," p. 75.

Dall, W. H.—"New West American shells," pp. 85-86.

Sigaretus oldroydii; *Pecten palmeri*; *P. randolphi*; *P. davidsoni*.

Ancey, C. F.—"Note on two species of *Helicina*," p. 87.

Considers that *H. rabei* recently described by Pilsbry = *H. rufocallosa* Anc., based upon examples distributed by Schmeltz under the erroneous name of *H. fischeriana* Montr.

Pilsbry, H. A.—"*Oxychona* unmasked," pp. 87-88.

The Brazilian species of *Oxychona* are found by Mr. Pilsbry from the characters of their radula and the sculpturing of the nepeonic shell, to belong to *Drymacus*. The Central American and Mexican species placed in *Oxychona* by Mr. Pilsbry must now be separated once more, and for them it is proposed to reinstate *Leptarionta* of Crosse and Fischer.

Wright, Berlin H.—"A new Plicate *Unio*," pp. 91-2

Unio walkeri.

Pilsbry, H. A.—"*Polygyra ferrissi*, n. sp.," p. 92.

Pilsbry, H. A.—A classified catalogue of American Land Shells with localities, pp. 59-60, 71-72, 83-84, 93-96.

NACHRICHTSBLATT DE DEUTSCHEN MALAKOZOOLOGISCHEN GESELLSCHAFT.

July to December 1897.

Moellendorff, O. von.—"Neue Landschnecken von Java," pp. 89-67.

New species of *Opeas*; *Tornatellina*; *Carychium*; *Leptopoma*; *Lagocheilus*; *Ditropis*; *Pupina*; *Alycaeus*, *Palaina*, *Diplommatina*, and *Georisa*.

Kobelt, W. and Moellendorff, O. von.—"Catalogue der gegenwartig lebend bekannten Pneumonopomen" (continued) pp. 105-120, and 147-152.

Moellendorf, O von.—"Cochlostyla-Studien," p. 121, pp. 153-172.

Rolle, H.—"Eine neue *Anodonta*,"

Anodonta bactriana.

Moellendorf, O. von.—"Studien zur Zoogeographie von Dr. Kobelt—Die Mollusken der Palaearktischen Region, Weisbaden, 1897," pp. 173-778.

Martens, E. von.—"Neue Arten und Varietäten," pp. 178-180.

New species:—*Helix (Camema) noelengi*; *Cyclophorus (Scabrina) basisulcatus*.

JOURNAL DE CONCHYLIOLOGIE, vol. xlv. Nos. 1 & 2

Bernard, Felix.—"Etudes comparatives sur la coquille des Lamellibranches II. Les genres *Philobrya* and *Hochstetteria*, pp. 5-47, pl. i.

Hervier, J.—"Descriptions d'espèces nouvelles de Mollusques provenant de l'Archipel de la Nouvelle-Calédonie (Suite)," pp. 47-69, pl. ii., and pp. 89-121, pl. iii.

New species of *Daphnella*; *Cithara*; *Mangilia*; *Mitra*; *Clathurella*.

Vignal, L.—"Note sur le *Cerithium (Gourmya) cirrho*. A. d'Orbigny," p. 69.

Drouet, H.—"Unionidae nouveaux ou peu connus," pp. 122-136.

Mayer-Eymier, C.—"Descriptions de Coquilles fossiles des terrains tertiaires supérieurs (suite)," pp. 136-149, pl. iv.

THE IRISH NATURALIST, August to December, 1897.

Adams, Lionel E.—"*Paludestrina (Hydrobia) jenkinsi* Smith." A new Irish Shell, pp. 234-236.

Mr. Adams suggests that as this species occurs in places where Baltic timber has been used, and as it has only of recent years been noticed, it may have been imported from the shores of the Baltic.

THE ESSEX NATURALIST, vol. x. April to June, 1897.

Webb, Wilfred Mark.—"The Non-Marine Molluscs of Essex (concluded), pp. 65-81.

Kennard, A. S., and Woodward, B. B.—With contributions by Webb, Wilfred Mark.—"The Post-pliocene Mollusca of Essex," pp. 87-109, table.

N.B.—For a resumé of the work in these two papers, see page 58 of this number.

JOURNAL OF THE LINNEAN SOCIETY OF LONDON ZOOLOGY,

Vol. xxvi., pp. 233-329, pls. 19 and 20.

Watson, R. Boog.—"On the Marine Mollusca of Madeira, with descriptions of thirty-five new Species and an Index list of all the known sea-dwelling Species of that Island."

REPRINTS.

From the JOURNAL OF THE ROYAL ASIATIC SOCIETY, CEYLON BRANCH, vol. xv., 1897, No. 48.

Collett, O.—The Terrestrial Mollusca of Ambagamuwa, 10 pp. Thirty-eight species.

From the ANNALS AND MAGAZINE OF NATURAL HISTORY, vol. xx, (1897).

Hugh, Fulton.—"Descriptions of two new species of *Amphidromus*," pp. 211-12, pl. vi., figs. 2 and 3. *Amphidromus floresianus* and *A. consobrinus*.

Hugh, Fulton.—“On supposed new species of *Oleacina*, *Trochomorpha*, and *Bulinulus*,” pp. 212-214.

Oleacina underwoodi; *Trochomorpha* (*Videna*) *andamanica*; *T.* (*V.*) *pseudosanis*; *Bulinulus* (*Drymaeus*) *bavoni*.

BULLETIN OF THE NATURAL HISTORY SOCIETY OF BRITISH COLUMBIA,
No. 2, pages 1-28, plates 1 and 2.

Dall, W. H.—“Notice of some new or interesting species of shells from British Columbia and the adjacent region.”

New species of *Crenella*, *Modiolaria*, *Nucula*, *Leda*, *Yoldia*, *Malletia*, *Macoma*, *Cadulus*, *Cythara*, ? *Mumiola*, *Odontostomia*, *Rissoina*, and *Molleria Encosmia*.

From the JOURNAL OF PHYSIOLOGY, vol. xxii. (1897).

Davenport, C. B. and Perkins, Helen.—“A contribution to the study of Geotaxis in the higher animals,” pp. 99-110.

Limax maximus was used in the experiments.

From “SCIENCE GOSSIP” (ns.), vol. iv.

Gude, G. R.—Armature of Helicoid Land Shells, pp. 70-1, 102-103, 138-139, 170-171 (see below page 44).

NOTES.

Distribution of *Testacella maugei*.

In view of Mr. Webb's studies on the distribution of the British species of *Testacella*, the following records for *T. maugei* may be of interest:—

SOMERSET.	Castle Cary (E. W. Swanton).
CORNWALL.	Phillack Rectory, Hayle (J. G. C. T.)
WARWICK.	Gardens near Birmingham (W. E. C.)
WORCESTER.	Nursery gardens near Worcester (W. E. C.)
CHESHIRE.	Gardens at Bowdon (W. E. C.)

The last three records are all of recent introduction.—W.E.C.

Notes on some Slugs from the Hebrides.

I have recently received from Mr. J. Steele Elliott, some slugs from St. Kilda, and also some from Mr. G. E. Allen, B.Sc., from Sanday, Orkney. As there are few records for these islands, it is desirable, I think, to record these specimens.

Mr. Elliott sent me four specimens of *Arion empiricorum*, Fér., and seven specimens of *Agriolimax agrestis*, L. Of the former, two are young. One or the adults is of the usual deep jet-black, with the foot-fringe and lineoles of the same colour and the foot-sole sepia-coloured; the other specimen is black on the dorsum, becoming plumbeous towards the foot-fringe. The head is lighter and somewhat mottled. Foot-fringe a yellowish-sepia with black lineoles. Foot-sole yellowish-sepia.

Mr. Allen collected seven specimens of *Arion*, four from West Brough, Sanday; four are *A. empiricorum*, Fér; the remaining three from Castle Green, Sanday, are very fine examples of the variety *johnstoni*, Kal., of *A. empiricorum*.—WALTER E. COLLINGE, F.Z.S., Mason University College, Birmingham.

Note on two species of *Veronicella* from Chili.

I have recently received from the Rev. H. M. Gwatkin, M.A., of Cambridge, four specimens of *Veronicella* from Chili. From an external examination of the same, I am of opinion that three are *V. nigra*, Heyn., 1885, originally described from specimens in the British Museum, and one *V. fusca*, Heyn., also described from a specimen in the British Museum.—W. E. C.

SPECIES OF PLECTOPYLIS RECENTLY DESCRIBED IN SCIENCE GOSSIP BY G. K. GUDE.

Plectopylis smithiana, Gude.

Shell dextral, discoid, widely umbilicated, rufous brown, coarsely and regularly ribbed, with scarcely visible microscopic sculpture above, but strongly decussated with spiral lines below, suture impressed. Whorls 6, convex, slowly increasing, the last rapidly widening towards the aperture, not angulated above, shortly descending in front. Aperture sub-triangular; peristome light brown, a little thickened and reflexed, the margins converging; parietal callus with a strongly raised flexuous ridge, separated from both margins of the peristome. Umbilicus very

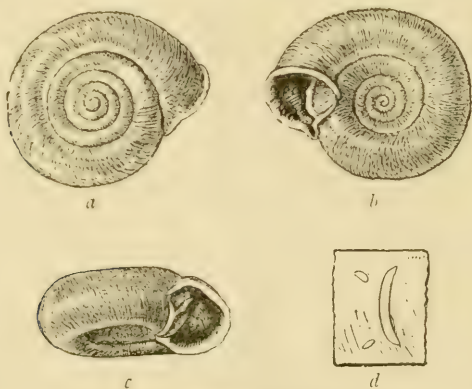


FIGURE 1.—*Plectopylis smithiana*, Gude.

wide but shallow. Parietal wall, with an entering flexuous horizontal fold, united to the ridge at the aperture, and at one-third of the circumference from the aperture with one crescent-shaped vertical plate, which has two small denticles, one above and one below, on the anterior side. Palatal folds 6, the first and sixth thin and horizontal, the other four short, broad and oblique.—Major diameter, 27 millimetres; minor diameter, 21 millimetres; axis, 10 millimetres.—Habitat, Attaram, Burma.—Type in the British Museum.

I found two specimens in the Theobald collection of the British Museum, labelled *Plectopylis brachyplecta*, which, in spite of some external resemblance to that species, presented sufficient differences to lead one to suspect that they were distinct, and on opening one of them I found that the difference in the armature confirmed this suspicion. In basing a new species upon them, I have much pleasure in dedicating it to Mr. Smith, whose permission to open the shell enabled me to investigate the matter.

Plectopylis smithiana differs from *P. brachyplecta* in being darker and larger. The ribs are coarser and the whorls more convex; the last whorl is not angulated above, and it widens more towards the aperture. The peristome is less thickened and more reflexed, and the ridge of the parietal callus less stout but more raised, while the umbilicus is wider and much more shallow. The horizontal parietal fold deflects more at the aperture and there is only one vertical plate (see fig. 1 d), which is crescent-shaped, with the convex side towards the aperture; on its anterior side, in place of a second vertical plate as in *P. brachyplecta*, are found two elongated, oblique, converging denticles, one above and one below. The palatal armature is similar to that of *P. brachyplecta*. Fig. 1 d, which shows the parietal wall, is from one of the specimens in the British Museum. Figs. 1a-1c are drawn from a specimen, labelled Attaram, obligingly lent to me by Miss Linter, of Arragon Close, Twickenham, who informs me that she received it from Mr. Theobald. This was also labelled *P. brachyplecta*, but I have no hesitation in referring it to the new species. It measures—major diameter, 26 millimetres; minor diameter, 21 millimetres; axis, 9 millimetres. (SCIENCE GOSSIP, New Series, Vol. III., March, 1897, p. 274. *By kind permission of the Editor*).

***Plectopylis plectostoma* var. *tricarinata*, Gude.**

Differs from the type in being larger, in having the periphery acutely keeled, and in having three raised ridges between the periphery and the suture, revolving as far as the fourth whorl.—Major diameter, 10 millimetres; minor diameter, 9 millimetres; axis, 6 millimetres.—Habitat, Bengal.—Type in the McAndrew collection of the University Museum of Zoology, Cambridge.

A tablet in the McAndrew collection contains five specimens, labelled "*Plectopylis plectostoma* Bengal, Benson coll.," two of

which are distinct from the type and appear to be worthy of a varietal name, Besides being larger and more conical than the type, they are also distinctly keeled at the periphery and have three distinct raised ridges on the upper side, revolving as far as the fourth whorl. I name this form *Plectopylis plectostoma* var. *tricarinata*. The entire shell is shown, enlarged, in fig. 2a, while a portion of the last whorl, more enlarged, is shown in fig. 2b. The armature is identical with that of the type. (*Ibid*, p. 275).

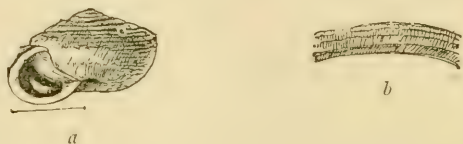


FIGURE 2.—*Plectopylis plectostoma* var. *tricarinata*, Gude.

Plectopylis affinis, Gude.

Shell sinistral, somewhat *widely* umbilicated, disc-shaped, *pale yellowish*, corneous, *translucent*, radiately plicate, *decussated* by spiral lines above, *smoother* and *shining* below. Whorls 7, narrow, increasing slowly, the last *widening* towards the aperture, and descending a little in front, rounded above, *flattened* below; *four* lines of soft pilose hairs pass round the whole length of the body whorl, the first on the angulated periphery, the second a little below it, the third midway between the second and fourth, which is near the umbilicus. Aperture ear-shaped, elongated *vertically*; peristome white, thickened and reflexed, upper margin a little *depressed*; the raised *flexuous* ridge on the parietal callus is separated from the margins by a slight notch. Umbilicus deep and moderately *wide*. The parietal armature consists of a vertical plate with two short supports anteriorly, one above and one below, and two elongated denticles posteriorly, one above and one below; *two* free, short, horizontal folds in a line occur below the vertical plate. The palatal armature is composed of six folds, the first and sixth short, thin and horizontal, the others longer and broader; the second a little indented in the middle, with the posterior termination raised obliquely; the third is notched in the middle, and deflects obliquely posteriorly; the fourth and fifth are in two series separated by a short space, the anterior portion straight and horizontal, the posterior portion crescent-shaped and obliquely descending.—Major diameter, 10 millimetres; minor diameter, 9 millimetres; axis, 5.5 millimetres.—Habitat, Khasia Hills, Assam.—Type in my collection.

Plectopylis affinis from the Khasia Hills, has hitherto been confused with *Plectopylis plectostoma*, but it differs in being larger and much paler in colour, in having four instead of five rows of hairs, which are not placed on raised ridges as in that species; the cuticle is much thinner and not plaited, while the spiral sculpture is less coarse above and scarcely perceptible below, where the shell is also more shining than in *P. plectostoma*. The shell is translucent and the armature is distinctly visible through its wall, while the aperture is more narrowed laterally and the upper margin of the peristome is less arcuate, being a little inflected. The umbilicus is also wider and scarcely angulated, while the base is much more flattened. The ridge of the parietal callus is more raised and more curved. The parietal armature consists of a vertical plate with a very short support anteriorly at the upper and lower extremities, but without the



FIGURE 3.—*Plectopylis affinis*, Gude.

horizontal fold above as in *P. plectostoma*. The two denticles on the posterior side are larger and more elongated, and below the vertical plate are two short, thin, horizontal folds in a line with each other (see fig. 3d, which shows the parietal wall by itself; and fig. 3c, which shows both armatures from the posterior side). The palatal armature is similar to that of *P. plectostoma*, but the posterior portions of the third, fourth and fifth folds, instead of being straight and almost vertical are crescent-shaped and oblique (see fig. 3b, which shows the palatal folds as they appear through the shell-wall); an additional semi-circular fold, posterior to, but a little, above the fifth fold, occurs in this specimen; this, however, I have not observed in any of the other specimens. Fig. 3a shows the entire shell enlarged. My specimens were obtained from Mr. Fulton some years ago; the twenty-five further specimens from the same locality, sent to me for inspection by him, range from 9 to 11 millimetres in diameter.

Two immature specimens in my collection are composed of five-and-a-half whorls; one of these has the immature barriers complete, but the palatal folds are very short and the posterior oblique portions of the fourth and fifth folds are almost straight instead of crescent-shaped; externally a slight trace of previous folds can be discerned; in the other specimen the last immature folds are similar to those of the first specimen, but the remains of a previous set is in a less advanced stage of disintegration. (*Ibid.*, p. 276).

***Plectopylis clathratuloides*, Gude.**

Shell depressed conical, moderately umbilicated, pale corneous, translucent, finely and regularly plicated by raised ribs above, finely and closely ribbed and a little shining below; whorls $5\frac{1}{2}$, slowly increasing, slightly convex, suture impressed, Periphery with an acute compressed keel, above which revolve 2 raised spiral ridges, the lower provided with a fringe of coarse

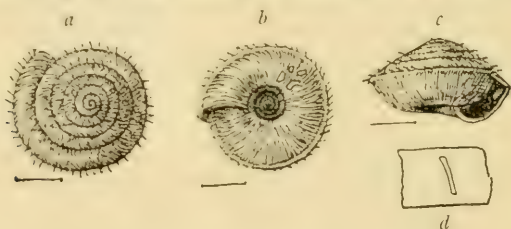


FIGURE 3.—*Plectopylis clathratuloides*, Gude.

hairs. Aperture subquadrate; peristome simple, a little thickened. Umbilicus deep and moderately wide. Parietal armature, one strong, vertical, simple plate. Palatal armature in two series; upper series with one posterior, vertical, conical tooth and one minute anterior denticle; lower series, with one posterior, vertical tooth and a small anterior denticle; in addition, one elongated horizontal fold below the umbilical angulation and a small fold above the peripheral angulation. Major diameter, 6 millimetres; minor diameter, 5.5 millimetres; axis, 3.5 millimetres.—Habitat, Anamullay Hills, India.—Type in Colonel Beddome's collection. (*Ibid* p. 333).

THE BRITISH SPECIES OF TESTACELLA.

By WILFRED MARK WEBB, F.L.S.,
Assistant Biologist to the Essex County Council,

[Continued from page 26.]

PLATE VI.

DISTRIBUTION.

Specimens of *Testacella* have been sent to the writer from several localities since the publication of the provisional list in the last number of THE JOURNAL, and the following records are given under specific headings as a continuation of it:—

Testacella haliotidea, Draparnaud.

- Somerset.**—Beckington, shells only. (H. Franklin Parsons).
Kent.—Kelsey Park, Beckenham. (Mark Webster).
Middlesex.—Royal Horticultural Society's Gardens, Chiswick, with *T. scutulum*. (E. Miller).
Surrey.—Sutton Common. (Maxwell T. Masters, M.D., F.R.S.)
Oxfordshire.—Middleton Park, Bicester, with *T. scutulum*. (Thos. Trollope).
Worcestershire.—Diglish House, Worcester. (Samuel Taylor). This is the third record for this city.
Nottinghamshire.—Carlton Hall, Carlton-on-Trent. (Louis Pope).
Lancashire.—Clayton Hall, Accrington. Dark variation. (Joseph Poulter).

Testacella scutulum, Sowerby.

- Middlesex.**—Royal Horticultural Society's Gardens, Chiswick, with *T. haliotidea*. (E. Miller).
Surrey.—Park Hill Rise, Croydon. (H. Franklin Parsons).
Oxfordshire.—Middleton Park, Bicester, with *T. haliotidea*. (Thos. Trollope).
Leicestershire.—Bean Manor Park, Loughborough. (Alfred Hamshire).

Testacella maugei, Férussac.

- Somerset.**—Sunnyside, Bridgewater. (Henry Corder).
Wiltshire.—Longleat Gardens, Warminster. Very fine specimens, with very dark and definite markings. (Josiah Trollope).
Pembroke.—Deer Park Villas, Tenby. (A. G. Stubbs).

N.B.—For other records for this species see a note by Mr. W. E. Collinge on page 43.

In the previous list, Walk-upon-Deane, page 25, three lines from the bottom, should read Wath-upon-Deane. Enfield, page 26, line 5, should have been included under Middlesex. Mr. Mansel-Pleydell's paper see the note on page 26, appeared in Proc. Dorset Nat. Hist. and A. F. Field Club, vol. xi. (1885).

EXTERNAL CHARACTERS.

There are one or two points with regard to the external characteristics of these slugs, that might be mentioned before beginning to consider their comparative internal anatomy.

The dorsal lines, or preferably dorsal furrows, were used to some extent as a distinguishing feature in the table of external characters, for the determination of the British species given by the writer in this journal *; but, in the case of the two species, *scutulum* and *haliotideia*, the size of the angle contained by the furrows was merely mentioned as being the greater in the latter species.

Mr. Taylor † pointed out a more definite difference, in that the furrows (he calls them lateral however, the lateral grooves in the writer's table being those which branch from the dorsal ones, after the manner of the side veins from the mid-rib of a leaf) meet outside the shell in *T. scutulum*; and Mr. Lionel Adams, in the second edition of his Manual ‡ uses this feature as a distinguishing one. The writer has found the distinction a constant one, and the following descriptions are quoted from the Manual:—

	<i>Testacella scutulum</i> , Sow.	<i>Testacella haliotideia</i> , Drap.
Dorsal furrows when the animal is extended.	"Branching off from a point outside, and just in front of the shell."	"Branching out from point just under the shell."

Since the table above referred to was published, the writer has noted several variations from the more generally occurring forms upon which it was based.

Judging from the Conchological Society's list, and Mr. Adams' Manual which follows it, one would imagine that either *Testacellae* did not vary, or that no variations had been noted, for instead of the long series of varietal names that is usually presented to the reader under the heading of each species, there occurs after the description of *T. maugei* alone, but a single variety, *viridans* (Morelet). To the writer the absence of these

* Volume iv. (1895), p. 76.

† Journal of Conchology, volume v. (July, 1888), p. 339.

‡ The Collector's Manual of British Land and Freshwater Shells, 2nd edition (1896), pp. 40 and 41.

names is a matter for rejoicing, but it is advisable, nevertheless, that all important variations should be recorded.

Testacella scutulum.

It is unlikely that many forms of *T. scutulum* would be recorded, for until recently, it was itself considered to be a variety. The writer recalls, however, some "sub-varieties" he thinks, from Gibraltar, described in "Science Gossip" a number of years ago by Mr. Cockerell, who has raised them to varietal rank in his "Check List of Slugs." *

The first two of the variations noted below as occurring in the British Isles, appear to correspond with a like number of Mr. Cockerell's "varieties."

Yellow form.—With dots.

Bright yellow form.—Without dots.

Brownish form.—The dots are very close, or have run together, thus giving the form a colour likeness to *T. haliotidea*.

In addition, it may be said that the dorsal furrows are (even when the dots are present) sometimes pigmented, sometimes not, and that when the general appearance lightens, the foot-sole whitens. In some specimens there is an orange margin to the foot-sole.

Testacella haliotidea.

If the "Check List" be again referred to, some seven "varieties" are given of *T. haliotidea*: these may or may not be based upon correctly determined specimens of the species. Several of the names have reference to slight variations in the shell alone, which could easily be picked out from a good series, such as the one before the writer. The albino is worth noting, and there is a yellow form also named by Moquin-Tandon which is really represented in *T. haliotidea*.

Among British examples, the writer identifies the following:—

Isabelline form. The body is compressed dorsiventrally, and its edges are wavy, giving a foliaceous appearance, which is enhanced by the mid-rib-like dorsal furrows with the lateral grooves running forwards and outwards from them, while other grooves often run in like manner up into the spaces between dorsal furrows. The foot-sole is quite white, but the sides are often tawny, this colour sometimes spreading to the back. This is by far the most general form.

* Journal of Malacology, vol. ii, (1893), p. 188.

Greyish brown form.—One specimen was of a very dark hue, with dorsal furrows of a still darker colour: the foot-sole was of a creamy white, and edged with a narrow line which was to all intents and purposes black, while down the centre from head to tail, ran a narrow stripe of brilliant orange-colour (apparently due to mucus as it could be removed.) Altogether the animal presented a very striking appearance. Only one dark specimen was received from Brandon, and a few somewhat lighter in colour from another locality. The shape of the body recalls somewhat that of the next form.

Yellowish form.—This variation resembles *T. scutulum*, in that yellow is the predominant colour (in some cases even of its foot-sole), and in its more cylindrical shape, but its shell, dorsal furrows, and internal anatomy are typical of *T. haliotidea*.

Testacella maugei.

The bronze variation of Morelet has not been seen by the writer, unless the first form mentioned below be the one:—

Tawny form.—The dark brown markings are fairly wide apart, but give a brown appearance at first sight; the ground colour being yellowish.

Brown form.—The ground colour is nearly obscured by the numerous markings.

Yellow form.—The markings are restricted, and the general appearance is yellow inclined to orange.

Gassies and Fischer mention albino, greyish black, greyish brown, greyish red (type of Férussac) and reddish brown "varieties," which are not quoted in the Check List, probably owing to the descriptions being so meagre. In some specimens of the first form of *T. maugei* the dorsal furrows and lateral grooves are so strongly pigmented that the likeness to a leaf is very marked; this leaf-like appearance was also noted under the last species. The writer has often noticed also a strong likeness between contracted specimens of *T. scutulum* (and in some cases of *T. haliotidea*), and half a broken pebble, the arched upper side of the slug corresponding with the original surface of the pebble, and the slightly convex underside, with the fractured surface of the flint, which is often higher in the centre. Correspondents point out the difficulty of finding *Testacellae*, as they "favour stones" so much.

REPRODUCTIVE SYSTEM.

As the differences in the genital organs have been the chief features relied upon for separating *T. haliotidea* and *T. scutulum*, it is as well perhaps to begin with the reproductive system of our British species.

The previous work of comparing these two species is as follows:—

* Monographie du Genre Testacelle, Actes Linn. Soc. Bordeaux xxi. (1858), p. 239

1888. J. W. Taylor.—On the specific distinctness and geographical distribution of *Testacella scutulum*, G. B. Sowerby, Journ. of Conch., vol. v. pp. 337, figs.

In this paper the result of anatomical work, by the late Charles Ashford, is given.

1893. Walter E. Collinge. The Morphology of the Generative System of the Genus *Testacella*. Ann. Mag. Nat. Hist, ser. 6, vol. xii., pp. 21-25, pl. i.

Briefly the facts are these. In 1885 Mr. Charles Ashford found that *Testacella scutulum* unlike *T. haliotidea* resembled *T. maugei* in having no flagellum to the penis. Mr. Taylor published these results (1888), and gave figures of the genital organs of the two first species. Mr. Collinge (1893) gave an account of the organs of *T. haliotidea* following Lacaze-Duthiers*; at the same time he criticized Mr. Taylor's description and figure, and proceeded to compare and figure the system, of all three species.

During the last few years the writer has dissected very many specimens of the two species *haliotidea* and *scutulum*, mainly with the object of testing specific determinations previously based upon external characters. In this process it was deemed sufficient for the purpose, to prove the presence or absence of the flagellum, and it was not until some yellow variations of *T. haliotidea* were examined more in detail, and with great care that the writer noticed any deviation from the simple form of penis figured by Lacaze-Duthiers, and later by Collinge, as typical of the species.

The deviation noted, recalled to mind the other figure given by Mr. Collinge of a variation, but the structure not being the same, the whole of the material available was carefully gone through with a view to finding out the most general form. In every specimen examined by the writer from some eighteen localities dotted about Great Britain, a form of penis was discovered differing from both of those figured by Mr. Collinge. In comparing the figure of the variation on Mr. Collinge's plate with its description, it was noted that such a form was stated to have been wrongly described and figured as typical, by Mr. Taylor. Upon turning to Mr. Taylor's paper, it was at once obvious that the form found by the writer was very similar to that described by the former as having "a tongue-like caecal process."

The structure found by the writer was more marked

* Histoire de la Testacella, Arch. de Zool. Expér et Gen (2), vol. V., (1887), pl. xxxvi.

in some examples than others, and in a few cases the elbow on the opposite side of the penis (not brought out in Mr. Collinge's figure) was hardly visible, and the process being turned back,



4 (after Gassies & Fischer)



7 (after Collinge)



5 (after Taylor)



8 (after Collinge)



6 (after Lacaze-Duthiers)

Figures 4 to 8—Various forms of the penis which have been given by different authorities, for *Testacella haliotidea*.

and closely applied to the adjacent organs, might almost have been overlooked.

As Mr. Collinge remarks that the figures and descriptions given by Mr. Taylor "leave much to be desired," and is severely

critical, perhaps it would be useful in the light of the point brought out and touched upon, to examine the critic's description in detail.

Mr. Collinge describes the anterior portion of the penis as being "sometimes dilated in a somewhat caecal-like form," and one acquainted with the anatomy of *T. haliotideae* might fancy that Mr. Collinge had seen the structure alluded to above, and that the dilatation refers to an apparently lateral outgrowth of the penis, which is, of course, a small caecum. A reference on the other hand, to the figure supplementing his description (reproduced, reversed in figure 8), shows that Mr. Collinge is not familiar with the characteristic "tongue-like caecal process" mentioned by Mr. Taylor, and found to be constant in British examples by the present writer, or at least, has not grasped its true configuration. The figure presents two swellings, one on each side of the penis, and as this organ is not shaded, it is further left to the imagination whether there may not be, after all, but one swelling extending all round the structure.

Mr. Taylor's sketch (reproduced in figure 5) at first sight, and taken by itself, is not very much more definite, though it will be seen that in reality it is more accurate. Both of the authors quoted from, allude to the caecum as occurring on the lower (anterior) part of the penis, whereas it will be seen from Plate VI. figure 1a that what they consider to be the upper portion of that organ is but a combination, apparently, of the flagellum and vas deferens which run side by side for some distance before they join the true evaginable penis, which shows by transmitted light a very different structure from them, as the bases of papillae, with which the penis is seen to be covered when extruded, are visible through its walls.

Further, in the specimens from seventeen different localities, the spermatheca is not round, but of a slightly pear-shaped oval, indicated by Mr. Taylor.

With regard to foreign examples, the writer's personal knowledge is at present confined to "*Testacella dubia* Poll."—received from Turin through the kindness of the describer, Signor Pollonera—which agrees with British examples of *T. haliotideae* in the shape of the penis, and is put down as a form of this species in the Check-list. A resumé of work other than that of Lacaze-Duthiers bearing upon the point at issue, in Continental specimens of *T. haliotideae*, is given below:—

1855. Moquin-Tandon.—"Histoire naturelle des Mollusques terrestres et fluviatiles de France," Plate V., fig. 16.

A swelling (dilatation inférieure) appears upon the penis at about the position occupied by the little caecum in British examples, and a lateral retractor (muscle latéral) noted by Mr. Taylor and the writer but not shown by Lacaze-Duthiers nor Collinge is figured.

1858. Gassies and Fischer.—"Monographie du Genre Testacelle," Actes Linn. Soc. Bordeaux, xxi., pl. I., fig. 15.

Mr. Taylor pointed out that this figure (a part of which is reproduced, figure 4) though labelled *maugei*, obviously belongs to *haliotidea* (a conclusion independently arrived at by the writer), and also that on the authority of these writers, Pollonera credited *T. maugéi* with a flagellum. A lateral retractor is indicated.

1889. Carlo Pollonera.—"Osservazione intorno ad alcune specie de *Testacella*." Boll. Mus. Zool. Anat. Comp., Torino, iv., pl. i., figs. 2 and 3.

The figure labelled *T. dubia* depicts a form of penis very much resembling that given in illustration of the present paper (plate VI., fig. 1), while this organ as given for *T. haliotidea* more resembles that called a variation by Mr. Collinge (reproduced in figure 8) in that it looks more like two swellings than like a single one and an elbow.

Signor Pollonera expresses his opinion that the form figured by Lacaze-Duthiers belongs to some other species differing from and wrongly determined as *T. haliotidea*; this still, however, remains to be proved. Further, he does not agree with Mr. Taylor's interpretation of Gassies and Fischer's figure, giving as his reasons small points of difference that would be put down by English malacologists as due to the individuality of the specimen or the figurer. Signor Pollonera gives, however, an excellent figure of the genitalia of *T. maugéi*, of course without a flagellum.

The evidence then, leads towards there being a form of *Testacella* as described by Lacaze-Duthiers and Collinge which differs from the more generally distributed *T. haliotidea* in some important particulars which may turn out to be of specific value.

Testacella scutulum.

In this species the writer has noticed that the retractor muscle of the penis is as broad as the terminal portion of that organ which is slightly constricted from the broader and preceeding part.

The spermatheca is usually round (as figured by Mr. Collinge), occasionally egg-shaped, but without, in the specimens examined, the much swollen basal part to the duct. (Plate VI., figure 2). The vagina is very long indeed.

Testacella maugéi.

The swollen basal part of the spermathecal duct is not inclined to be globular, according to the writer's dissections, but to be of an oval, gradually diminishing into the more ordinary proportions of the duct at the extremities. The lateral entry of the duct into the spermatheca was not noted. (Plate VI., figure 3).

THE DISTRIBUTION OF BRITISH NON-MARINE MOLLUSCS.

I. HAND LIST FOR ESSEX.

In accordance with an announcement made in the Journal, it is proposed to publish Hand Lists of the Non-Marine Molluscs occurring in the various Counties of the British Isles. In order to make such lists really complete, and of greater value, there should be included in them the names of extinct and other species, found fossil in the Counties to which they refer. There are, however, many difficulties in the way of doing this. In the first place, very few of the published Lists of Fossil Shells are reliable. Again, the labour of working through these lists with the specimens which have been preserved, is greater than anyone who has not participated in it would believe, and as there are but two or three workers in this difficult branch of the subject, the progress made is correspondingly small.

Under these circumstances it is possible that all fossil records may not be included in every list, though as the Essex Post-Pliocene Mollusca have been recently worked out in great detail, they are included in the present one.

Authorities for the following List in whose papers reference to previous work on the subject will be found.

1897. **Wilfred Mark Webb.**—"The Non-Marine Molluscs of Essex." *Essex Nat.*, Vol. X. (1897) pages 27-48, and 65-81.

1897. **A. S. Kennard and B. B. Woodward**, with contributions by **Wilfred Mark Webb.**—"The Post-Pliocene Non-Marine Mollusca of Essex." *Essex Nat.*, Vol. X. (1897) pages 87-109.

N.B.—The Editor of the "*Essex Naturalist*"—**William Cole**—has since pointed out that specimens of *Dreissensia polymorpha*, from the Lea, are in the Epping Forest Museum. *Essex Nat.*, vol. x., p. 189.

HAND LIST OF THE NON-MARINE MOLLUSCS OF ESSEX.

The species living in the County are marked with a cross (+); those found fossil, with a star (*). Extinct Forms are in Roman type.

A. GASTROPODA.

I. PULMONATA.

a. Stylommatophora

Testacella—

- maucei*, Fér.
- + *haliotidea*, Drap.
- + *scutulum*, Sow.

Limax —

- + *maximus*, Linn.
- + *flavus*, Linn.
- + *arborum*, Bouch.-Chant
- + *hedleyi*, Coll.

Agriolimax—

- + **agrestis*, Linn
- + *lævis*, Müll.

Amalia

- + *sowerbii*, Fér.
- + *gagates*, Drap.

Vitrina—

- + *pellucida*, Müll

Vitrea—

- + **crystallina*, Müll.
- + *lucida*, Drap.
- + *alliaria*, Miller
- + *glabra*, Brit. Auct.
- + **cellaria*, Müll.
- + **nitidula*, Drap.
- + **fura*, Ald.
- + **radiatula*, Ald.
- + **excavata*, Bean
- + **nitida*, Müll
- + **fulva*, Müll.

Arion—

- + *ater*, Linn.
- + *elongatus*, Coll
- + *flagellus*, Coll.
- + *hortensis*, Fér.
- + *circumscriptus*, John.
- + *intermedius*, Norm.
- + *lusitanicus*, Mab.
- + *subfuscus*, Drap.

Geomalacus—

- + *maculosus*, Allman

Punctum—

- + **pygmaeum*, Drap.

Pyramidula—

- + *rupestris*, Drap.
- + **ruderata*, Stud.
- + **rotundata*, Müll.

Eulota—

- + **fruticum*, Müll.

Helicella—

- + **virgata*, Da. C.
- + **itala* Linn.
- + **caperata*, Mont.
- + *barbara*, Linn.
- + *cantiana*, Mont.
- + **carthusiana*, Müll.

Hygromia—

- + *fusca*, Mont.
- + **granulata*, Ald.
- + **hispida*, Linn.
- + *revelata*, Fér.
- + **rufescens*, Penn.
- + *umbrosa*, Partsch

Acanthinula—

- + **aculeata*, Müll.
- + **lamellata*, Jeff.

Vallonia—

- + **pulchella*, Müll.

Helicodonta—

- + *obvoluta*, Müll.

Helicigona—

- + **lapicida*, Linn.
- + **arbustorum*, Linn.

Helix—

- + **aspersa*, Müll.
- + *pomatia*, Linn.
- + **nemoralis*, Linn.
- + **hortensis*, Müll.
- + *pisana*, Müll.

Buliminus—

- + **montanus*, Drap.
- + **obscurus*, Müll.

Pupa—

- + *secale*, Drap.
- + **anglica*, Fér.
- + **cylindracea*, Da. C.
- + **muscorum*, Linn.

Sphyradium—

- + **edentulum*, Drap.

Vertigo—

- + **minutissima*, Hartm.
- + **antivertigo* Drap.
- + **substriata*, Jeff.
- + **pygmaea*, Drap.
- + **alpestris*, Alder
- + **mouliinsiana*, Dup.
- + **pusilla*, Müll.
- + **angustior*, Jeff.

Balea—

- + **perversa*, Linn.

Clausilia—

- + **laminata*, Mont.
- + **bidentata*, Ström.
 biplicata, Mont.
 pumila, Ziegl.
 **rolphii*, Gray

Cochlicopa—

- + **lubrica*, Müll.

Azeca—

- + **tridens*, Pult.
 elongata, Taylor

Caecilianaella—

- + **acicula*, Müll.

Succinea—

- + **putris*, Linn.
- + **elegans*, Risso.
 **oblonga*, Drap.

Oncidiella—

- celtica*, Cuv.

b Basommatophora.

Carychium—

- + **minimum*, Müll.

Melampus—

- + *denticulatus*, Mont.

Alexia—

- + **myosotis*, Drap.

Leuconia—

- + *bidentata*, Mont.

Ancylus—

- + **fluviatilis*, Müll.

Velletia—

- + **lacustris*, Linn.

Limnaea—

- + **auricularia*, Linn.
- + **pereger*, Müll.
- + **palustris*, Müll.
- + **truncatula*, Müll.
- + **stagnalis*, Linn.
- + *glabra*, Müll.
 involuta, Harv.

Amphipeplea—

- glutinosa*, Müll.

Planorbis—

- + **corneus*, Linn.
- + **albus*, Müll.
- + **glaber*, Jeff.
- + **nautilus*, Linn.
- + **carinatus*, Müll.
- + **marginatus*, Drap.
- + **vortex*, Linn.
- + **spiroborbis*, Müll.
- + **contortus*, Linn.
- + **fontanus*, Lightf.
- + **lineatus*, Walker

Physa—

- + **fontinalis*, Linn.
- + **hyfluorum*, Linn.

II. PROSOBRANCHIATA.

Paludetrina—

- + *confusa*, Frau.
- + *jenkinsi*, Smith.
- + **ventrosa*, Mont.
- + **stagnalis*, Bast.
 **marginata*, Mich.

Bythinia—

- + **tentaculata*, Linn.
- + **leachii* Shepp.

Vivipara—

- + **vivipara*, Linn.
- + **confecta*, Millett

Valvata—

- + **piscinalis*, Müll.
- + **cristata*, Müll.

Assimineae—

- + *grayana*, Leach

Pomatias—

- + **elegans*, Müll.

Acicula—

- *lineata*, Drap.

Neritina—

- + **fluviatilis*, Linn.

B. PELECYPODA.

Dreissensia—

- + **polymorpha*, Pall.

Unio—

- *littoralis*, Lam.
- + **pictorum*, Linn.
- + **tumidus*, Retz.
 margaritifer, Linn.

Anodonta—

- + **cygnaea*, Linn.

Corbicula—

- *fluminalis*, Müll.

Sphaerium—

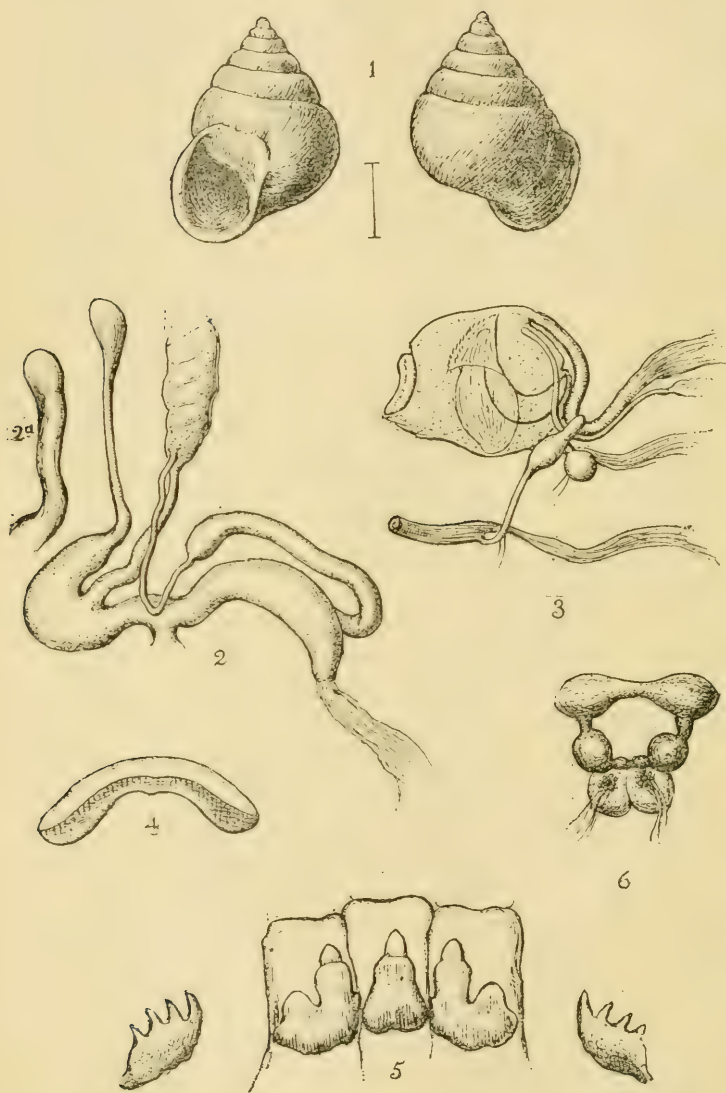
- + *rivicola*, Leach.
- + **corneum*, Linn.
- + *ovale*, Fèr.
- + *lacustre*, Mull

Pisidium—

- + **amnicum*, Müll.
- *astartoides*, Sandb.
- + **pusillum*, Gmel.
- + *nitidum*, Jenyns.
- + **fontinale*, Drap.
- + *milium*, Held.

INDEX TO VOLUME VI.

	PAGES.
ARION, Some observations on certain species of	7
<i>Azeca elongata</i> , Taylor	15
BOOKS RECEIVED—	II, 29, 39
British Non-Marine Molluscs, Distribution of. Hand list for Essex ..	57
British Species of <i>Testacella</i>	25, 49
<i>Buliminus</i> (<i>Ovella</i>) <i>acutus</i> , n. sp.	36
<i>Buliminus</i> (<i>Ovella</i>) <i>innocens</i> , n. sp.	36
<i>Buliminus</i> (<i>Passamaia</i>) <i>bentii</i> n. sp.	35
<i>Buliminus</i> (<i>Passamaia</i>) <i>mirabilis</i> , n. sp.	34
<i>Buliminus</i> (<i>Passamaia</i>) <i>rotundus</i>	35
<i>Buliminus sinistrorsus</i> , Deshayes, On the Anatomy of	I
<i>CLAUSILIA makasquirensis</i> , n. sp.	23
<i>Clausilia pyrrha</i> , n. sp.	23
<i>Clausiliae</i> , recorded from Celebes, with descriptions of two new species, Notes on the	23
Cockerell, T. D. A.	3
Collinge, Walter E.	7, 43
Colombia, Description of New species of Land Shell from ..	27
DISTRIBUTION of British Non-Marine Molluscs	57
Distribution of British Species of <i>Testacella</i>	25, 49
EDITOR'S NOTES	32
<i>Ennea cylindracea</i> , n. sp.	34
Essex, Hand List of the Non-Marine Molluscs of	57
<i>HELICELLA ericetorum</i> , Müller, On the Specific Name of	28
<i>Helix ericetorum</i> , Müller, On the Specific Name of	6
<i>Helix nemoralis</i> , Linnè, and <i>Helix hortensis</i> , Müller, Notes on ..	17
Horsley, J. W.	17
JOURNAL de Conchyliologie, Dates of Publication of	15
KENNARD, A. S.	6, 28
<i>Labyrinthus assimilans</i> , n. sp.	27
Land Shell from Colombia, Description of a New Species of ..	27
Land Shells from the Island of Socotra, On some New Species of ..	33
<i>Lithidion bentii</i> , n. sp.	38
MOSS, William, and Wilfred Mark Webb	I
NEW SPECIES, Note on the <i>Clausiliae</i> , recorded from Celebes with Description of two	23
New Species of Land Shell from Colombia, Description of a	28
New Species of Land Shells from the Island of Socotra	
Notes	15, 43
PLECTOPYLIS recently described in "Science Gossip," by G. K. Gude, New Species of	
SCIAGRAPHS of Shells, some. Supplement to No. I .. follows page 16	
Slugs, A few Notes on	3
Smith, Edgar A.	27, 28, 33
Stevenson, F.	32
Sykes, E. R.	15, 23
TAYLOR'S Monograph of British Land and Freshwater Mollusca (Review of Part IV).	II
<i>Testacella</i> , The British Species of	25, 49
WEBB, W. M.	I, 25, 49



W. J. Webb del. ad nat.

Garratt & Walsh scu'pt.

Bulimus sinistrorsus, Deshayes.

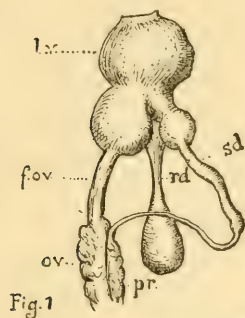


Fig. 1

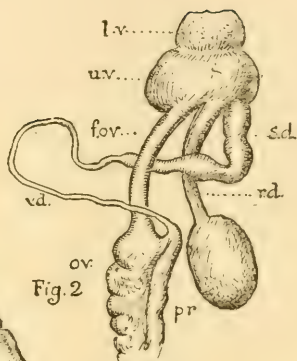


Fig. 2

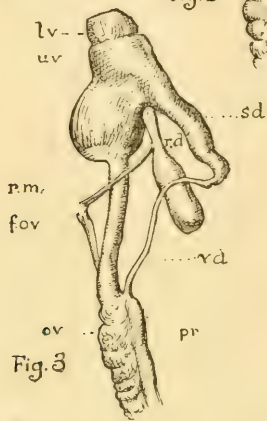


Fig. 3

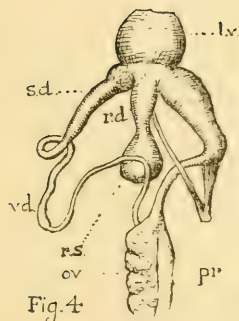


Fig. 4

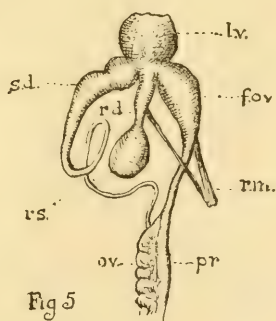


Fig. 5

SOME SCIAGRAPHS OF SHELLS.

The sciagraphs given on the accompanying plate are of shells in the writer's possession and were kindly made by Messrs. W. Watson & Sons of High Holborn, London, expressly for the *Journal of Malacology*.

EXPLANATION OF PLATE III.

FIGURES 1 to 7 are a series of shells of a cowry *Cypraea arabica*, from the South Pacific Isles, shewing the changes which take place during growth.

FIGURES 1 and 2. Young specimens, in which the shell is a simple spiral one with a thin unreflected lip. N.B.—The spires are somewhat worn at the tip.

FIGURE 3. In this shell the lip has expanded, the edge has curled inwards, and a row of "teeth" is beginning to make its appearance there.

FIGURE 4. Here, another row of "teeth" is to be seen on the body of the shell approximately parallel to that on the edge of the lip.

FIGURE 5. This shell is thicker owing to the deposition of layers of "nacre" upon its outside by the mantle-flaps which are protruded by the animal and which cover the shell and meet in the middle line on its dorsal surface. The "teeth" are now more evident.

FIGURE 6. The thickening process is being carried on, the shell being considerably heavier and more massive.

FIGURE 7. The adult shell, in which almost the maximum of thickening has been reached, and the broadening of the shell achieved: the longitudinal expansion of the lip, too, has now hidden the spire of the younger shell.

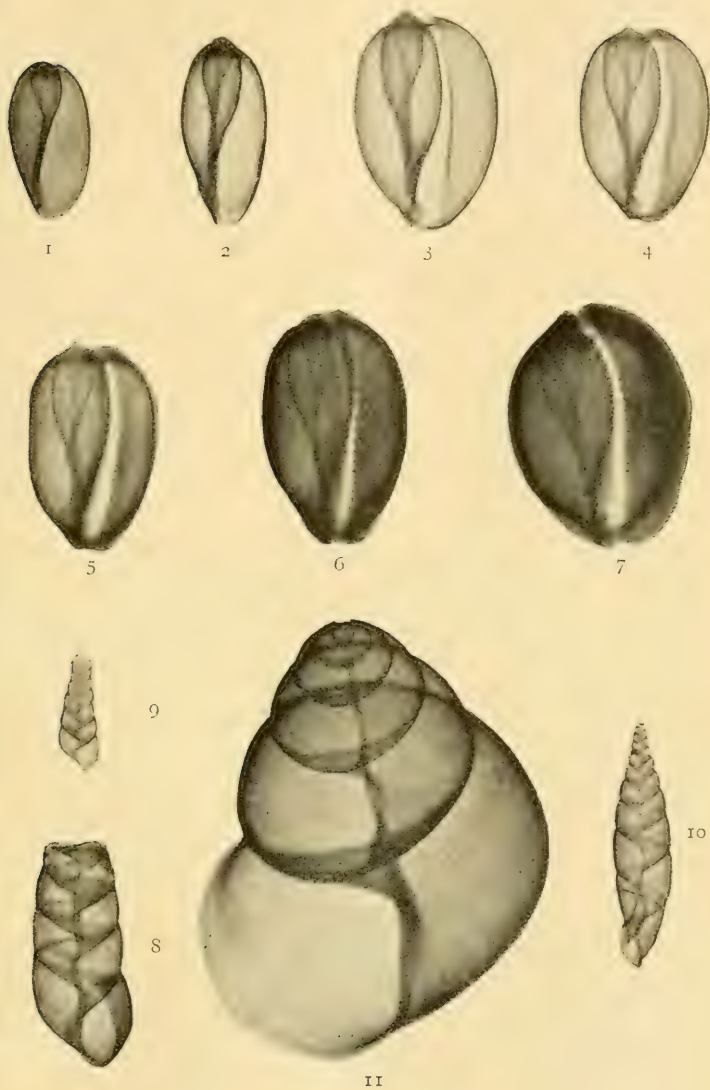
FIGURES 8 to 11 are sciagraphs of three land shells which show the columella and the interior of the shell as well as other points noted below.

FIGURE 8. A shell of *Bulinus decollatus*, from Malta, which loses its top whorls as it grows; the partition which divided the uninhabited portion of the shell from the rest is shewn.

FIGURE 9. A young shell of the same, still retaining its apex and from its position on the plate shewing how much shell has been discarded by Figure 8.

FIGURE 10. *Clausilia swinhoei*, from Formosa, showing the clausium or clausilium which guards the entrance of the shell.

FIGURE 11. *Cochlostyla philippinensis*, from the Philippine Islands.



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Some Sciagraphs of Shells.



3



1



5



4



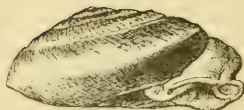
2



6



7



8



9

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NEW SPECIES OF LAND SHELLS.

Clausilia pyrrha.

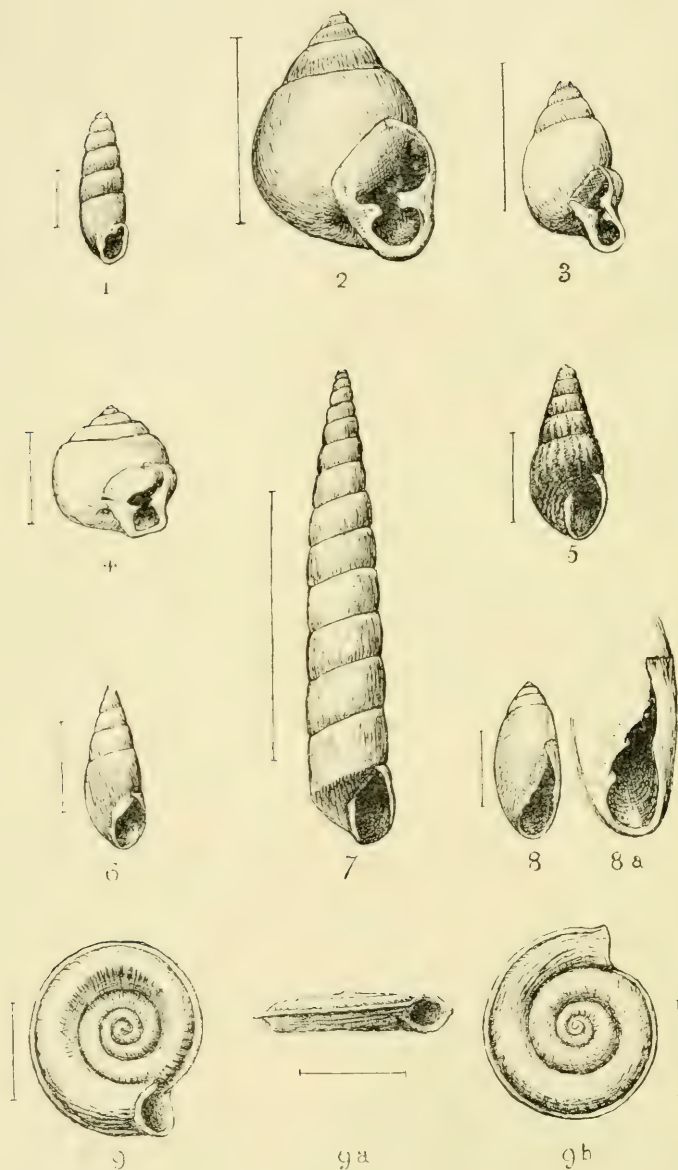
Clausilia makassarensis.

Labyrinthus assimilans.

Figure 1, the shell $\times 2$. Figure 2, its lower whorls enlarged.

Figures 3 & 5, shells $\times 2$. Figures 4 & 6, their lower whorls enlarged.

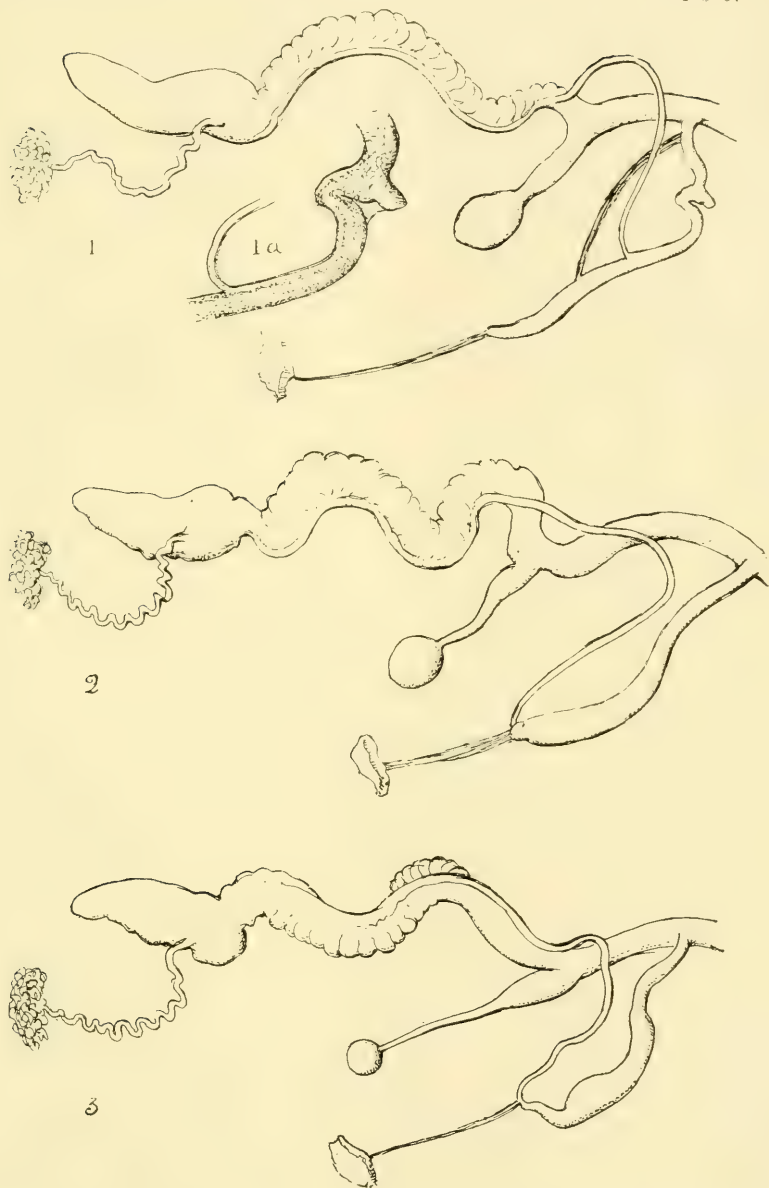
Figures 7, 8 & 9, the shell $\times \frac{5}{4}$.



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REPRODUCTIVE SYSTEM IN BRITISH TESTACELLAE.

Figure 1, of *T. haliotideae*, figure 1a, the junction of the penis with the vas deferens and flagellum much enlarged. Figure 2, of *T. scutulum*. Figure 3, of *T. maugeti*. Figures 1, 2 and 3 are medium-sized specimens enlarged twice linear.

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VOL. VI. (No. 1.)

CONTENTS.

MAY 3rd, 1897.

(Issued *Rec'd June 1*)

	PAGE.
On the anatomy of <i>Bulinus sinistrorsus</i> , Deshayes (<i>Plate I</i>) .. By William Moss and Wilfred Mark Webb, F.L.S.	1
A few notes on Slugs By Professor T. D. A. Cockerell, F.Z.S.	3
On the specific name of <i>Helix ericetorum</i> , Müller. .. By A. Santer Kennard	6
Some observations on certain species of <i>Arion</i> (<i>Plate II</i>). By Walter E. Collinge, F.Z.S.	7
Books received	11
Notes	15
Supplement. Some Sciagraphs of Shells (<i>Plate III</i> .)	

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Species Manufacture	" p. 88
Additions to our List of Specialists Prepared to Determine Fossils	" p. 122
Fresh-water Biological Stations: Europe's Example. By Professor Anton Fritsch, Ph.D. (Illustrated.)	...	...	...	...	MARCH, p. 169
The Shell-Ornaments of the Mas d'Azit Scholars	APRIL, p. 219
The Horn Expedition to Central Australia	" p. 254

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VOL. VI. (No. 2.)

CONTENTS.

JULY, 1897.

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Recd Oct. 5

PAGE.

Notes on <i>Helix nemoralis</i> Linné and <i>Helix hortensis</i> Müller	By the Rev. J. W. Horsley, M.A.	17
Note on the <i>Clausiliae</i> recorded from Celebes, with descriptions of two new species ..	By E. R. Sykes, B.A., F.Z.S.	23
The British Species of <i>Testacella</i> (continued) ..	By Wilfred Mark Webb, F.L.S.	25
Description of a New Species of Land Shell from Colombia	By Edgar A. Smith, F.Z.S.	27
On the specific name of <i>Helicella ericetorum</i> , Müller	By Edgar A. Smith, F.Z.S.	28
Books received	29
Editor's Note	32

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VOL. VI. (Nos. 3 & 4.) CONTENTS. SEPT. & DEC., 1897.
(Issued January 22nd, 1898).

	PAGE.
On some New Species of Land Shells from the Island of Socotra (Plate V. frontispiece) Edgar A. Smith, F.Z.S.	33
Books received	39
Notes	43
Species of <i>Plectophylis</i> recently described in "Science Gossip" by G. K. Gude	44
The British Species of <i>Testacella</i> , continued—Distribution and Repro- ductive System (Pl. VI.) Wilfred Mark Webb, F.L.S.	49
The Distribution of British Non-Marine Mollusca, I. Hand List for Essex	57
Index to this Volume	60
Title Page, and List of Species described for the first time in this volume	..

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MALACOLOGY."

EDITED BY
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CONTENTS OF VOLUME VII.

	PAGE
Introduction.	I
Description of a new species of <i>Cryptosoma</i> (<i>C. austeni</i>). By WALTER E. COLLINGE, F.Z.S. (Plate i.)	2
In Memoriam: M. H. Crosse. By the Rev. A. H. COOKE, M.A., F.Z.S.	4
Species of <i>Plectopylis</i> recently described in "Science Gossip." By G. K. GUDE, F.Z.S. (Illustrations.)	7
Literature on the Anatomy of the <i>Solenidae</i> . By H. HOWARD BLOOMER.	16
On the dimensions of some <i>Arion empiricorum</i> , Fér. By GUY BREEDEN.	16
New Locality for <i>Hygromia revelata</i> . By B. B. WOODWARD.	16
<i>Limax variegatus</i> , Drap., var. <i>rufescens</i> , Moq., in Warwickshire. By WALTER E. COLLINGE.	16
Slugs from North Devon. By WALTER E. COLLINGE.	16
The specific position of the reputed British <i>Hyalinia glabra</i> , Studer. By W. MOSS, F.C.A.	25
Notes on the species of <i>Ennea</i> and <i>Leptopoma</i> recorded from Ceylon, with descriptions of some new Land Shells from that island. By E. R. SYKES, B.A., F.Z.S. (Plate ii.)	26
<i>Phasianella "palla" or "pullus"?</i> By the Rev. A. H. COOKE, M.A., F.Z.S.	31
On the occurrence in Ireland of <i>Arion empiricorum</i> , Fér., var. <i>bocagei</i> , Simr. By WALTER E. COLLINGE, F.Z.S.	33
Species of <i>Plectopylis</i> recently described in "Science Gossip." By G. K. GUDE, F.Z.S. (Illustrations.)	34
Mollusca of Grange-over-Sands, Lancashire. By H. V. FOWLER, M.A.	38
Note on some Slugs from Teneriffe. By WALTER E. COLLINGE and F. J. PARTRIDGE.	38
Malacological Communications from New Zealand. By HENRY SUTER. (Plate iii.)	49
On some Land Shells from Somaliland. By EDGAR A. SMITH, F.Z.S. (Illustrations.)	57
Notes on the nomenclature of the British Nudibranchiata, with a detailed classification of the group. By the Rev. A. H. COOKE, M.A., F.Z.S.	59
Description of a new species of <i>Mitra</i> (<i>M. baldwini</i>) from the Hawaiian Islands. By JAMES COSMO MELVILL, M.A., F.L.S. (Illustration.)	67
On the anatomy and systematic position of some recent additions to the British Museum collection of Slugs. By WALTER E. COLLINGE, F.Z.S. (Plates iv—v.)	77
On two new varieties of <i>Catalulus nietneri</i> , G. and H. Nev., from Ceylon. By OLIVER COLLETT, F.R.M.S. (Illustrations.)	85
<i>Helix</i> (<i>Epiphaedusa</i>) <i>bellotti</i> , Forbes, and its habitat. By Mrs. M. BURTON WILLIAMSON.	87

	PAGE
On the relative claim to priority of <i>Papuina wiegmanni</i> and <i>P. tuomensis</i> . By G. K. GUDE, F.Z.S.	88
<i>Subulina octona</i> , Chemn., in Kew Gardens. By E. R. SYKES.	91
Notes on some specimens of <i>Plectopylis</i> . By G. K. GUDE.	91
Additional records to the Mollusca of Carnarvonshire and Merionethshire. By H. H. BLOOMER.	91
The Land Shells of the Caroline Islands. By O. F. von MOELLENDORFF, Ph.D. (Illustrations.)	101
Note on Helicoid Land Shells from the Canary Islands. By G. K. GUDE.	127
Note on the Asiatic species of <i>Philomycus</i> . By T. D. A. COCKERELL.	127
Description of a new species of <i>Anadenus</i> from China. By WALTER E. COLLINGE. (Plate vi.)	133
On some malformed specimens of <i>Anodonta cygnea</i> , L. By H. H. BLOOMER. (Plate vii and Illustrations.)	136
Notes on the genus <i>Sesara</i> , Alb., with descriptions of two new forms. By G. K. GUDE, F.Z.S. (Illustrations.)	139
Description of a new variety of <i>Isomeria subcastanea</i> , Pfr. By G. K. GUDE, F.Z.S. (Illustrations.)	144
Obituary. G. Sherriff Tye. (Plate viii.)	146
The genus <i>Histiopsis</i> , Hoyle, preoccupied. By WALTER E. COLLINGE.	147
A List of a small collection of Shells from China. By EDGAR A. SMITH, F.Z.S. (Illustrations.)	157
Descriptions of two new species of Shells: <i>Murex marcoensis</i> and <i>Cassia booleyi</i> . By G. B. SOWERBY, F.L.S. (Illustrations.)	162
Malacological Notes. By E. R. SYKES, B.A., F.L.S. (Illustrations.)	164
On a British species of <i>Myrina</i> , with a note on the genus <i>Idas</i> . By J. T. MARSHALL. (Illustrations.)	167
On some large specimens of <i>Valvata piscinalis</i> . By WALTER E. COLLINGE.	170
Note on <i>Helix rufescens</i> . By H. WILLOUGHBY ELLIS.	170
Notes on some further malformed specimens of <i>Anodonta cygnea</i> , L. By H. H. BLOOMER. (Illustration.)	177
Description of a new species of <i>Veronicella</i> from the Fiji Islands. By WALTER E. COLLINGE.	179
Note on the <i>Gaeotis douvillei</i> of de Morgan. By WALTER E. COLLINGE.	179
<i>Helix lapicida</i> , L., mons. <i>sinistrorsum</i> , nov. ? By F. J. PARTRIDGE.	180
Proceedings of the Midland Malacological Society	17, 39, 68, 91, 127, 148, 171, 181.
Current Literature.	19, 40, 70, 93, 128, 149, 171, 182.
General Reviews.	132, 154, 187.
Editor's Notes.	24, 48, 76, 100, 132, 156.
Corrigenda.	147.

LIST OF ILLUSTRATIONS IN VOLUME VII.

	PAGE
New species of <i>Cryptosoma</i> . Plate I.	4
<i>Plectopylis muspratti</i> , Gude.	8
<i>Plectopylis stenochila</i> var. <i>basilia</i> , Gude.	9
<i>Plectopylis magna</i> , Gude.	10
<i>Plectopylis lissochlamys</i> , Gude.	12
<i>Plectopylis leucochila</i> , Gude.	14
<i>Plectopylis perrieræ</i> , Gude.	15
New Land Shells from Ceylon. Plate II.	30
<i>Plectopylis blanda</i> , Gude.	34
<i>Plectopylis trochospira</i> var. <i>boholensis</i> , Gude.	35
<i>Plectopylis achatina</i> var. <i>obesa</i> , Gude.	35
<i>Plectopylis achatina</i> var. <i>infrafasciata</i> , Gude.	36
<i>Plectopylis achatina</i> var. <i>venusta</i> , Gude.	37
New Zealand Mollusca. Plate III.	56
<i>Ennea somaliensis</i> , n. sp.	58
<i>Buliminus (Petraeus) somaliensis</i> , n. sp.	59
<i>Mitra (Strigatella) baldwinii</i> , n. sp.	67
British Museum Slugs. Plates IV and V.	85
<i>Cataulus nietneri</i> , G. and H. Nevill.	86
<i>Cataulus nietneri</i> v. <i>caperata</i> , n. var.	86
<i>Cataulus nietneri</i> v. <i>unicolor</i> , n. var.	86
<i>Flammulina</i> (s. str.) <i>nigrescens</i> , Mlldff. Jaw, Radula, etc.	108
<i>Anadenus dautzenbergi</i> . Plate VI.	135
<i>Anodonta cygnea</i> , L. Part of animal showing malformations	137
<i>Anodonta cygnea</i> , L. Plate VII.	138
<i>Sesara harmeri</i> , n. sp.	139
<i>Sesara diplodon</i> , Benson.	139
<i>Sesara harmeri</i> v. <i>anodonta</i> , n. var.	140
<i>Isomeria subcastanea</i> v. <i>kobeltiana</i> , n. var.	145
<i>Isomeria subcastanea</i> , type.	145
Portrait of G. Sherriff Tye. Plate VIII.	146
<i>Vivipara wingatei</i> , n. sp.	158
<i>Vivipara auriculata</i> , Marts.	159
<i>Murex marcoensis</i> , n. sp.	162
<i>Cassia booleyi</i> , n. sp.	163
A three-valved <i>Ischnochiton</i>	164
Shell and valves of a South African species of <i>Cryptoplax</i>	165
<i>Acroptychia pyramidalis</i> , n. sp.	165
<i>Clausilia granulosa</i> , n. sp.	166
<i>Myrina simpsoni</i> , n. sp.	168
Transverse section of <i>Anodonta cygnea</i> , L.	

CORRIGENDA.

(See also page 147.)

p. 23	line 31	for 1868	read 1898.
p. 31	„ 18	„ <i>T. rochus Magus</i>	„ <i>Trochus Magus</i>
p. 37	„ 19	„ varieties	„ varieties.
p. 46	„ 20	„ chæmalonic	„ chameleonic.
p. 162	„ 8	„ narcoensis	„ marcoensis.
p. 176	„ 1	„ Chnch	„ Church.
p. 176	„ 13	„ lhe	„ the.
p. 176	„ 24	„ are omitted	„ is omitted.
p. 176	„ 28	„ thn	„ the.

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JOURNAL OF MALACOLOGY.

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INTRODUCTION.

ON resuming the editorship of the "Journal of Malacology," from which I retired in 1895, I beg to express my thanks to the many malacologists, in all parts of the world, who have again promised to give the paper their support.

While dealing largely with the slug and slug-like genera of molluscs, papers treating of *all branches of the Mollusca* will be included, as well as short notes upon the same.

The Bibliography will be restricted to books and papers sent in by their respective authors, and those of special interest in the current magazines, etc.

Without boasting, it may be fairly claimed for the "Journal," that it has now the largest and widest circulation of any publication devoted solely to the Mollusca.

I have agreed to publish in the pages of the "Journal," free of any cost to the Society, the "Proceedings of the Midland Malacological Society."

I hope in the present volume to improve the illustrations and to increase their number, but this can only be done by considerably increasing the cost of the "Journal." I trust, therefore, that I may count upon the same kind and generous support which malacologists have given me in the past, so that the "Journal of Malacology" may continue to be, as it was described in 1895, "the leading English Journal and Review of its specific subject."

W. E. C.

DESCRIPTION OF A NEW SPECIES OF CRYPTOSOMA (*C. AUSTENI*).

By WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

(Plate I.)

(Read before the Midland Malacological Society, Aug. 12th, 1898.)

THE following description is from a single specimen sent to me from Calcutta as a species of *Helicarion*. On referring to Godwin-Austen's account of *Cryptosoma præstans*, Gould,¹ and the figures which accompany the same, also specimens of the shell of *C. præstans*, Gould, in the Theobald Collection in the Museum of Mason University College, and others in my own collection, it was at once evident that this was a species referable to the genus *Cryptosoma*, Theobald,² the differences, however, externally, and those in the form of the generative organs, necessitate its separation from *C. præstans*, Gould, I have therefore associated with it the name of Lieut-Col. H. H. Godwin-Austen, F.R.S.

Cryptosoma austeni, n. sp.

Animal (Pl. I, figs. 2—4) a light yellowish-brown, darker on the head and posterior dorsum, which latter is sharply keeled. Right shell-lobe moderately well developed, left shell-lobe very large. Right dorsal lobe somewhat triangular in shape. Left dorsal lobe broad and narrow, and rather darker than the right one, being finely spotted with black. Caudal mucous pore large, with no overhanging lobe. Rugæ large. Peripodial groove distinct, terminating at the dorsal margin of the mucous pore. Foot-fringe same colour as the body, with fine closely set lineoles, extending to dorsal margin of the mucous pore (Pl. i, fig. 2). Foot-sole divided into median and lateral planes, the former smoother and rather lighter in colour than the rest of the body, the latter are transversely marked and similar in colour to the rest of the body (Pl. i, fig. 3). Extremity of foot-sole rounded (Pl. i, fig. 3).

Length (in alcohol) 22.5 mm.; breadth of foot-sole in widest portion, 4.5 mm.

¹ Land and Freshwater Mollusca of India, 1882, pt. 1, p. 14, pl. 1v, figs. 1—12b.

² Journ. Asiat. Soc. Bengal, 1857, p. 252.

Shell (Pl. i, fig. 1) apex depressed, thin, striæ definite, brownish or horn colour.

Hab. Calcutta (Coll. of W. E. C.).

I have given in figure 5 a part of the generative organs of *C. præstans*, Gould, built up from the three figures given by Godwin-Austen (*t. c.*) for comparison with those in this species (Pl. i, fig. 4).

In *C. austeni* the vagina is a long straight tube, from the top of which the elongated sessile receptaculum seminis opens. The free-oviduct is a wide tube gradually expanding as with the vas deferens it gives place to the oviduct proper and prostate. The penis is a short, broad tube, constricted on its inner surface (Pl. i, fig. 4, *p*). In *C. præstans*, Gould, Godwin-Austen describes the penis as being "much convoluted and closely folded together," which feature is shown in fig. 9 (*t. c.*, pl. iv). In *C. austeni* the penis lies ventral to, and at the outer side of, the vagina and free-oviduct. At the distal extremity and on its dorsal side, there is a small kalc-sac given off, unfortunately this was damaged in dissection. I believe it was a somewhat ovoid-shaped body and a little larger than the receptaculum seminis, but as I am not quite certain, I have left it incomplete in figure 4. From the inner and dorsal side of the penis, at a point almost exactly opposite to the origin of the kalc-sac, the vas deferens arises, the retractor muscle of the penis being inserted above and between the two (Pl. i, fig. 4, *r. m.*). The dart-sac is a wide muscular tube, narrowing slightly as it approaches the U-shaped bend towards the distal end (Pl. i, fig. 4, *d. s.*). The distal extremity is rather narrower and pointed. There was no dart present.

A comparison of the terminal ducts of the generative organs of *C. austeni*, with those of *C. præstans*, Gould, shows many striking differences. The peculiar-shaped dart-sac in this latter species with its bulbous proximal end, is very distinct from that organ in *C. austeni*, while in the form of the penis and receptaculum seminis, the differences are still more striking.

Externally there are also a few interesting points of difference from *C. præstans*, in the shape and size of the mantle and shell-lobes. The left shell-lobe and left dorsal lobe of *C. austeni* are considerably smaller than in the former species, while the right shell-lobe and the right dorsal lobe are much larger (*cp.* Godwin-Austen, *t. c.*, pl. iv, figs. 2—5). In life the right shell-lobe of *C. austeni* must extend a considerable distance over the surface of the shell, much more so than is shown in Stoliczka's beautiful figure of *C. præstans*, given by Godwin-Austen (*t. c.* pl. iv, fig. 1). Finally the shell of *C. austeni* is smaller, thinner, and much more fragile than that of *C. præstans*, Gould.

EXPLANATION OF PLATE I.

- Fig. 1.—*Cryptosoma austeni*, *n. sp.* Shell. $\times \frac{1}{5}$.
 Fig. 2.— „ „ View of the animal from the right side,
 after the removal of the shell, $\times 3$.
 Fig. 3.— „ „ Portion of foot-sole, showing median
 and lateral planes and extremity of
 foot-sole, $\times 3\cdot5$.
 Fig. 4.— „ „ Terminal ducts of the generative or-
 gans.
 Fig. 5.—*Cryptosoma preestans*, Gould. Terminal ducts of the genera-
 tive organs (after Godwin-Austen).

REFERENCE LETTERS.

<i>d. s.</i>	Dart-sac.	<i>p.</i>	Penis.
<i>f. ov.</i>	Free-oviduct.	<i>pr.</i>	Prostate.
<i>k. s.</i>	Kalc-sac.	<i>r. s.</i>	Receptaculum seminis.
<i>l. d. l.</i>	Left dorsal lobe of the mantle.	<i>r. d. l.</i>	Right dorsal lobe of the mantle.
<i>l. p.</i>	Lateral plane of the foot-sole.	<i>r. m.</i>	Retractor muscle of the penis.
<i>l. s. l.</i>	Left shell-lobe.	<i>r. s. l.</i>	Right shell-lobe.
<i>m. p.</i>	Median plane of the foot-sole.	<i>v. d.</i>	Vas deferens.
<i>ov.</i>	Oviduct.	<i>vg.</i>	Vagina.

IN MEMORIAM: M. H. CROSSE.

BY THE REV. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

THE scientific world in general, and malacologists in particular, will have learned with profound regret the news of the death of M. Joseph Charles Hippolyte Crosse, which took place on August 7, 1898, at his country residence, the Château d' Argeville, at Vernou, near Paris. No man of his time has done more, few have done as much, to promote the study of the Mollusca, and in him France has lost one of her most distinguished men of science. It was one of those strange coincidences that sometimes occur to us all, that I should have been walking down the Rue Tronchet in Paris, and wondering whether I should call at No. 25, only the day before I returned home to hear of his death, and receive the request to write this obituary notice.

Born in 1827, it was in 1851 that Crosse contributed his first paper (*Notice sur l'habitat du Panopaea Aldrovandi, de Sicile*) to the *Journal de Conchyliologie*, which was then in the second year of its existence, edited by M. Petit de la Saussaye. It gives us some idea of the strides which the science has made since those days to learn that then malacology was still governed by the systems of Lamarck and of Cuvier. Reeve, Sowerby, and Kiister had but recently commenced their iconographies, Kiener had suspended his, the Adams' *Genera*, Philippi's *Handbuch*, Gray's *Guide*, Woodward's and Chenu's *Manuals* were yet to appear. Geographical distribution, as a serious study, was absolutely unknown.

It is with the *Journal de Conchyliologie* that Crosse's memory will be for ever associated. His name first appears on the titlepage of that periodical in 1861, and it is not too much to say that to him and his distinguished colleague, Dr. P. Fischer, who, considerably the younger man, predeceased him by nearly half a decade, is due the entire credit of carrying on for more than thirty years a publication which has consistently maintained the highest standard of excellence in the articles which have appeared in its pages. Not to speak of innumerable minor notices and reviews of books, Crosse contributed, from his own pen alone, 249 articles, 86 in conjunction with P. Fischer, and 13 more in conjunction with A. C. Bernardi, T. Bland, O. Debeaux, E. Marie, and Dr. Souverbie, making a grand total of 348. He was singularly faithful to his own Journal, for the only contributions he ever appears to have made to any other recognised scientific paper were six articles which appeared in the years 1855-59 in the *Revue et Magasin de Zoologie*.

Crosse's knowledge of the Mollusca was not confined to any special group or groups, but was far-reaching and comprehensive. Naturally, his acquaintance with anatomical details was subordinate to his familiarity with other portions of the study. The Land Mollusca of New Caledonia and of Mexico are perhaps the two fields on which he will be found to have left the most permanent traces of his ability. The former he dealt with in the columns of the *Journal* alone, the latter, in collaboration with Dr. P. Fischer, in the *Études sur les Mollusques terrestres et fluviatiles du Mexique et du Guatemala*, which formed, with an Atlas of 71 Plates, the two large quarto volumes making up Part VII of the *Recherches Zoologiques*, compiled by the *Mission Scientifique au Mexique et dans l'Amérique Centrale*, and published by order of the Minister of Public Instruction in France (1870-1893). He also began, in conjunction with the same author, the *Histoire Naturelle des Mollusques terrestres et fluviatiles de*

Madagascar (1889), but this work does not appear to have been completed.

He was especially fond of cataloguing the Molluscan fauna of islands. Some of his lists, thus compiled, are invaluable to the student of geographical distribution, remarks upon which generally accompanied the lists. Among the islands thus treated are Rodriguez, Kerguelin, Socotra, Prince's and St. Thomas Is. (W. Africa), Nossi-Bé and Nossi-Comba, Trinidad, Cuba (177 pp.), San Domingo (143 pp.), Porto Rico, and New Caledonia (315 pp.). His sympathy with problems of geographical distribution is further shown by such articles as the following: *Distribution géographique et synonymie des Bulimes auriculiformes de l'Archipel Viti*; *Catalogue des Mollusques qui vivent dans le Déroit de Behring et dans les parties voisines de l'Océan Arctique*; *Faune malacologique du Lac Tanganyika, du Lac Baikal*.

Another marked feature of his writings is the cataloguing of all the known species of certain genera, often with synonymy and geographical distribution appended. Among the genera thus treated are *Cancellaria*, *Conus*, *Holospira*, *Hybocystis*, *Lyria*, *Meroe*, *Opisthostoma*, *Parmacella*, *Pirena*, *Placobranchus*, *Pleurotomaria*, *Pomatias*, *Rapa*, *Rhodea*, *Risella*, and *Voluta*.

It naturally befel one who had the handling of vast masses of material, to found new genera, as well as innumerable new species. Yet he was no sympathiser with the "splitting" school, and discountenanced, rather by example than by rebuke, the folly of those who reduce the science to confusion by manufacturing a new species for every second specimen. To Crosse are due, either singly or in conjunction with P. Fischer, the following amongst other genera:—*Acroptychia*, *Berendtia*, *Diplomphalus*, *Eucalodium*, *Geostilbia*, *Guestieria*, *Pereiraea*, *Strebelia*, and *Xanthonyx*.

I believe Crosse possessed a special sympathy for England and English workers. Certainly his encouragement of young contributors was charming, and his courtesy never failed. His knowledge of English was remarkable, and he was capable of translating articles from that language into French without missing the smallest point or losing the most delicate shade of meaning. Besides possessing numerous other titles of honour, he was a Corresponding Member of the Zoological Society of London, and a Member of the Malacological Society of London. All English Malacologists will unite in a respectful testimony to his great distinctions. And perhaps no better epilogue could be framed for him than the words with which he closed his own exhaustive treatise on the Mollusca of New Caledonia, words of characteristic modesty:—"Nous terminons ici notre travail,

dont nous ne nous dissimulons nullement les imperfections, mais qui aura, nous l'espérons du moins, l'avantage de faire connaître aux naturalistes, que ces sortes d'études intéressent, l'état actuel de la science . . . et de leur servir de point de départ pour de nouvelles recherches . . . où il doit y avoir encore bien de découvertes à faire pour les explorateurs."

SPECIES OF PLECTOPYLIS RECENTLY DESCRIBED IN "SCIENCE GOSSIP."¹

By G. K. GUDE, F.Z.S.,

London.

Plectopylis muspratti, Gude.

Shell sinistral, discoid, widely and deeply umbilicated, pale corneous, streaked transversely with dull brown; finely striated and decussated with spiral lines, which are very distinct on the upper surface, but less so below. Suture impressed, spire a little conical. Whorls six and a half, scarcely convex, slowly increasing, the last widening towards the aperture, slightly angular above, descending suddenly in front, and a little constricted behind the peristome. Aperture roundly lunate, peristome white, thickened and reflexed, margins converging. Parietal callus with a strongly raised flexuous ridge, which is separated from both margins by a little notch. Umbilicus wide and deep. Parietal wall with a short entering flexuous fold united to the ridge at the aperture, becoming attenuated inwardly, and at one-third of the circumference from the aperture, with a strong, crescent-shaped vertical plate, which is suddenly deflected posteriorly at the lower extremity; below this, on the anterior side, occurs a very short, horizontal fold. Palatal folds six, horizontal, short; the first free, with a small denticle posteriorly; the second, third, fourth, and fifth connected with each other by a vertical ridge, which deflects below the fifth fold posteriorly and terminates in a small, oblique denticle; the sixth again free.—Major diameter, 13 millimetres; minor diameter, 11 millimetres; axis, 6 millimetres.

Habitat, Naga Hills, Assam.—Type in Colonel Beddome's collection.

¹ Reprinted from "Science Gossip," N.S. vol. iv, 1897-1898. By kind permission of the Editor.

With a number of *Plectopylis* kindly sent to me by Colonel Beddome for inspection, were three shells which he thought would

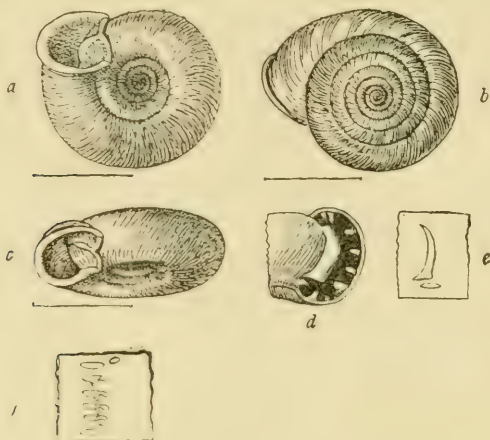


Fig. 5.—*Plectopylis muspratti*, GUDE.

prove to be new. Upon examination I found them to differ from all the described species, and now, therefore, publish this form as a new species under the above name, which was suggested by Colonel Beddome. *Plectopylis muspratti* in outward appearance somewhat resembles *Plectopylis nagaensis* ("Science Gossip," N.S., vol. iii, p. 206, fig. 33), but the armature is quite different. The parietal armature (see figs. *e* and *d'*) consists of a strong, vertical lunate plate, strongly deflected posteriorly below, the convex side towards the aperture: below, on the anterior side, is a very short horizontal fold; a short, entering, flexuous, horizontal fold occurs at the aperture and is joined to the flexuous raised ridge which unites the two margins of the peristome. The palatal armature consists of: first, a free, short, horizontal fold with a small denticle posteriorly; next, four short, horizontal folds connected by a slight vertical ridge about their middle; the posterior halves of the folds being thinner and slighter than the anterior halves; the vertical ridge is continued below the fifth fold, where it suddenly deflects posteriorly and terminates in a small oblique denticle; below the fifth fold, a little nearer to the aperture, is found a sixth fold, which, like the first, is quite free (see fig. 5*f*, which shows the inner side of part of the outer wall with its palatal folds, and fig. 5*d*, which gives the posterior view of the parietal and palatal armatures).—"Science Gossip," iv, p. 10.

Plectopylis stenochlia, var. basilia, Gude.

Differs from the type in the more conical spire, the more flattened whorls and the acutely keeled periphery.—Diam., 6-7 millimetres.

Habitat, Badung, Province Hoo-Pé, China.



Fig. 6.—*Plectopylis stenochlia*, var. *basilia*, GUDE.

Plectopylis stenochlia, var. *basilia*, from Badung, Province of Hoo-Pé, was sent to me by Professor Oscar Boettger, of Frankfort. It has a more conical spire and the whorls are more flattened than in the type (see "Science Gossip," N.S., vol. iii., p. 204, f. 29); the periphery is acutely keeled, while in the type it is rounded. The parietal armature differs in having only four simple denticles anteriorly to the vertical plate, the second denticle being very minute (see fig. 6c); the palatal armature is identical with that of the type.—Ibid. p. 36.

Plectopylis magna, Gude.

Shell sinistral, solid, discoid, widely and deeply umbilicated, horny brown, finely and regularly ribbed. Suture slightly impressed, spire depressed, apex scarcely raised. Whorls $7\frac{1}{2}$, a little rounded above, tumid below, increasing very slowly, the last widening a little towards the aperture, descending somewhat slowly in front, and a little constricted behind the peristome. Aperture elliptical, peristome white, thickened and reflexed, margins scarcely converging. Parietal callus with a raised flexuous ridge, separated from both margins of the peristome by a little notch. Umbilicus wide and deep. Parietal wall with a short, entering, flexuous, horizontal fold, which terminates at a distance of two millimetres from the parietal ridge at the aperture, and having at one-third of the circumference from the aperture two strong transverse plates; the

posterior one the longest, vertical, and a little flexuous, giving off a short, obliquely raised ridge posteriorly above, and a short, strong, obliquely deflexed ridge posteriorly below; the anterior one oblique, the upper extremity converging towards the posterior plate, where it gives off posteriorly a short, strong ridge, and anteriorly a strong, longer ridge, which becomes attenuated; at the lower extremity it gives off two short, strong ridges, one posteriorly and one anteriorly; below these plates occurs a thin fold, close to the lower suture, revolving as far as the aperture, where it unites with the flexuous ridge. Palatal folds, 5: the three upper horizontal; the first straight and having an elongated denticle below it at about the middle; the second a little deflected posteriorly; the third short, crescent-shaped; the fourth vertical, flexuous; the fifth horizontal, abruptly deflexed anteriorly above and posteriorly below. Posteriorly between the first and fifth folds occur six denticles, placed vertically in a row, the first in a line with the elongated denticle below the first fold, the second a little above and the third a little below the second fold, the fourth in a line with the upper extremity, the fifth near the middle, and the sixth a little below the lower extremity of the vertical fold.—Major diameter, 22·5-25 millimetres; minor diameter, 18·5-21 millimetres; axis, 8 millimetres.

Habitat, Burma.—Type in my collection.

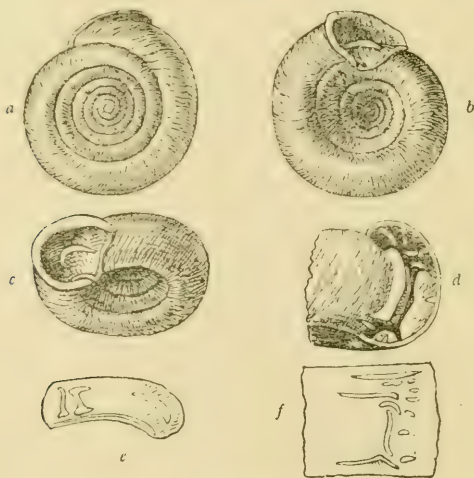


Fig. 7.—*Plectopylis magna*, GUDE.

With a miscellaneous collection of *Plectopylis*, from Burma, kindly sent to me by Miss Linter, Arragon Close, Twickenham, were two

forms which appear to be undescribed, and, although closely allied to each other and to *Plectopylis ponsonbyi* ("Science Gossip" N.S., vol. iii, page 178), they present sufficient differences to warrant their being regarded as distinct. Three of the specimens in question belong to the form which I now publish as a new species under the name of *Plectopylis magna*. A shell in the collection of Mr. E. R. Sykes, which had been labelled *P. achatina*, I also refer to this species. This new form differs from *P. ponsonbyi* in being much larger, more solid, and darker in colour, in having one whorl more, in the last whorl descending less abruptly, and in the whorls being more rounded. There are also differences in the armature, *i. e.* the two parietal vertical plates are convergent above, and the posterior one is considerably longer than the anterior one (see fig. 7*e*), while in *Plectopylis ponsonbyi* they are almost equal and parallel; the anterior plate gives off anteriorly, below a short, stout ridge, not a distinct fold as in *P. ponsonbyi*, and the thin fold near the suture is distinctly continued to the ridge at the aperture, without becoming attenuated; the two upper palatal horizontal folds are much thinner, the third is short and crescent-shaped, and the vertical fold is not bilobed, while there are several more denticles posteriorly (see fig. 7*f*, which shows the inside of the outer wall). The specimen figured, received from Miss Linter, as above mentioned, is in my collection, and measures 25 millimetres in diameter. A second specimen measures 22.5 millimetres in diameter. The third specimen is not quite mature, the ridge on the parietal callus at the aperture not being formed, but the armature is quite identical with that of the mature shells. Figs. 7 *a*, *b*, *c*, and *e* are natural size, figs. 7 *d* and *f* are magnified.—(Ibid., p. 70.)

Plectopylis lissochlamys, Gude.

Shell sinistral, solid, discoid, widely and deeply umbilicated, polished, corneous, finely and regularly ribbed, decussated with minute spiral sculpture above. Suture impressed, apex a little raised, spire depressed. Whorls 7, rounded, increasing slowly, the last twice as wide as the penultimate, widening towards the aperture, but not constricted behind the peristome. Aperture rounded, elliptical; peristome white, rather thin, reflexed; margins a little converging. Parietal callus with a raised flexuous ridge separated from both margins of the peristome by a little notch. Umbilicus wide and deep. Parietal wall with a short, entering, flexuous horizontal fold, which runs close up to the ridge at the aperture, and at one third of the circumference from the mouth there are two rather thin

transverse parallel plates, descending obliquely backwards, the posterior one longest and with a short ridge posteriorly both at the upper and the lower extremities; the anterior one with a longer ridge anteriorly at the upper extremity, and two short but stouter ridges at the lower extremity, one anteriorly and one posteriorly; below these plates occurs a thin horizontal fold close to the lower suture, becoming attenuated but distinctly perceptible at the aperture, where it unites with the flexuous ridge. Palatal folds, 5; the three upper horizontal, thin, the first and second with a denticle posteriorly; the third deflected posteriorly; the fourth vertical, the upper part deflexed anteriorly, the lower part deflexed posteriorly, with two denticles posteriorly, one about the middle and one near the lower extremity; the fifth short, horizontal, indented at the middle, with a slight curved denticle posteriorly.—Major diameter, 19.20 millimetres; minor diameter, 16 17 millimetres; axis, 6.7 millimetres.

Habitat, Burma.—Type in my collection.

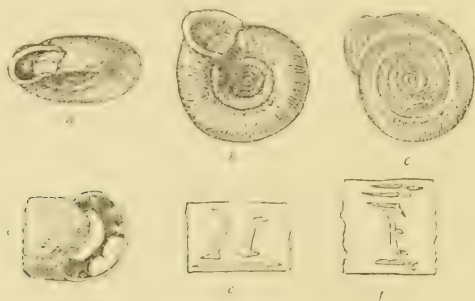


Fig. 8.—*Plectopylis lissochlamys*, GUDE.

The form received with *P. magna*, as above mentioned, I propose to distinguish as *Plectopylis lissochlamys*. Two specimens were sent to me by Miss Linter. Dr. von Möllendorff, the German Consul in Manila, Luzon, however, has obligingly sent me for inspection several specimens of *Plectopylis*, amongst which are two (labelled *Plectopylis refuga*) which I refer to this new species. *Plectopylis lissochlamys* differs from *P. magna* in being much smaller and shining, as well as paler in colour; the shell in shape and texture resembling *Plectopylis pulvinaris*, which, however, is a dextral shell ("Science Gossip," N. S., vol. iii, page 180, fig. 25). It is more solid and darker in colour than *P. ponsonbyi* and it is more coarsely ribbed; the two last whorls increase more suddenly, and the last is not constricted behind the peristome as is the case in *P. ponsonbyi*. The two parietal plates (see

fig. 8*e*) are much thinner, and the anterior ridges of the anterior plate much shorter and slighter than those of *P. ponsonbyi*; they are parallel instead of convergent as in *P. magna*. A comparison of the figures will indicate differences in the palatal armature. The specimen figured is in my collection and measures 19 millimetres in diameter. Figs. 8*a-c* are natural size, while figs. 8*d-f* are magnified. Fig. 8*d* shows the parietal and palatal armature from the posterior side; fig. 8*e* a part of the parietal wall with its plates; and fig. 8*f* the inside of the outer wall with its folds and denticles.—(Ibid., p. 70—71.)

***Plectopylis leucochila*, Gude.**

Shell sinistral, rather solid, discoid, deeply and perspectivevely umbilicated, pale yellowish-corneous, finely and regularly ribbed, ornamented with minute spiral sculpture. Suture almost linear, spire depressed, apex scarcely raised. Whorls seven to seven and a-half, a little rounded above, rather tumid below, increasing slowly and regularly, the last descending abruptly and rather deeply in front. Aperture roundly oval; peristome white, a little thickened and strongly reflexed, the margins a little converging; parietal callus with a slightly raised flexuous ridge, separated from both margins of the peristome by a little notch. Umbilicus deep, widely perspective. Parietal wall with two transverse oblique plates converging upwards, the posterior one rather thin, slightly sinuous, and having a short ridge posteriorly at the upper and lower extremities, the anterior one shorter, but much stronger and stouter, having an ascending ridge posteriorly above and a short stout support posteriorly below; on the anterior side are found two strong horizontal folds, the lower stout and short and becoming suddenly attenuated; the upper fold long, rather thinner, following the deflection of the last whorl and terminating close to the ridge at the aperture, but not being united to it; a very thin horizontal fold rises below the transverse plates close to the lower suture, runs parallel with it, and terminates at the ridge at the aperture. Palatal folds, five: the first near the suture, straight and nearly horizontal; the second a little more oblique and deflected posteriorly; the third nearly horizontal, but more deflected posteriorly; all three have a slight indentation near the posterior extremity forming a bead-like termination; the fourth is vertical deflected a little anteriorly above and posteriorly below, having posteriorly a small denticle near the lower extremity and another about the middle; the fifth is near the lower suture, horizontal and deflected at both extremities.—Major diameter, 15-17 millimetres; minor diameter, 12-14 millimetres; altitude, 6-7 millimetres.

Habitat, Burma.—Type in my collection.

Five shells, labelled "Burma," without further indication of locality, received by the writer, from Mr. Hugh Fulton, under the name of *Plectopylis leiophis*, proved upon examination to be distinct, and to belong, in fact, to a different group of *Plectopylis*. They represent a

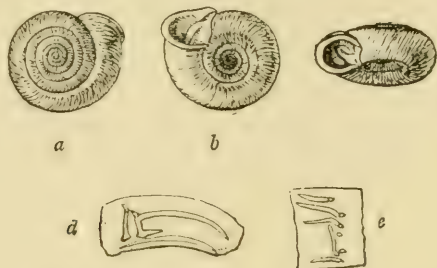


Fig. 9.—*Plectopylis leucochila*, Gude.

species—for which I propose the name *Plectopylis leucochila*—allied to *P. ponsonbyi*, but differing from it in the more raised spire and in having a deeper and more perspective umbilicus. In the armature this new species differs from the other members of the group of *P. ponsonbyi* in having the upper parietal fold uninterrupted. Figs. 9 *a-c* show the shell in three different aspects, natural size, while figs. 9 *d* and *e* are enlarged: the former shows the parietal wall with its plates and folds, and the latter the inside of the outer wall with the folds and denticles.

***Plectopylis perrieræ*, Gude.**

Shell sinistral, discoid, widely and deeply umbilicated, pale corneous, very finely and regularly striated, and decussated by spiral lines. Suture slightly impressed, spire flattened, apex a little raised, whorls six to seven, increasing slowly and regularly, flattened above, rounded below, the last angulated above the periphery and round the umbilicus, and decending shortly and abruptly in front. Aperture heart-shaped; peristome white, scarcely thickened, a little reflected; the margins united by an elevated sinuous ridge on the parietal callus, notched at the lower junction. Umbilicus wide and deep. Parietal wall with a thin vertical plate, strongly deflected posteriorly below, and giving off a short horizontal ridge at the upper extremity on each side; a long horizontal flexuous fold rises close to the upper extremity of this plate on the anterior side, decending suddenly at first, then ascending gradually, and afterwards gradually descending, following the deflection of the last whorl, becoming united to the ridge at the

aperture; a second, shorter, horizontal fold occurs below this one, rising close to the lower extremity of the vertical plate, proceeding horizontally at first, and then ascending a little; another very thin fold rises below the vertical plate, running parallel to the lower suture as far as the aperture, where it unites with the ridge. Palatal folds, five: the first rather long and thin, near to and parallel with the suture, with a deep indentation near the posterior extremity, dividing it into two unequal parts; the second, horizontal, a little deflected posteriorly, with an elongated denticle posteriorly, and a second, smaller, one above the first; the third fold much shorter, strongly curved downwards posteriorly, with a minute denticle posteriorly; the fourth fold vertical with an obliquely descending ridge posteriorly at the upper extremity, and bifurcated at the lower extremity, the anterior arm of the bifurcated the shorter; a minute denticle occurs near the ridge at the upper extremity and a second one near the middle, both on the posterior side; the fifth fold is thin, horizontal, and strongly deflected on both sides.—Major diameter, 15 millimetres; minor diameter, 12 millimetres; altitude, 5 millimetres.

Habitat, Thayet-Mayo, Pegu, Burma.—Type in my collection.

Two specimens of an undescribed *Plectopylis* have been obligingly placed in my hands by Miss Linter, at whose request I name it after her friend, Mrs. Lumley Perrier. In contour this new species resembles *Plectopylis perarcta*, but the shell is much larger. The

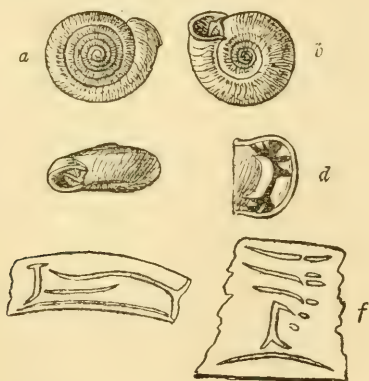


Fig. 10.—*Plectopylis perrieriae*, GUDF.

parietal armature further connects it with the species named, but the palatal armature is more like that of *P. leiophis*. The two specimens of the new species are stated by Miss Linter to be from Thayet-Mayo, Pegu, Burma; a third specimen, which is in Miss Linter's collection,

is accompanied by a label bearing the locality, Niningo (Burma?), but I have failed to trace this name in any of the maps and gazetteers to which I have access.

The specimen figured, and the one in Miss Linter's collection, have the measurements given in the diagnosis, but my second specimen measures only 12.5 millimetres in diameter. Figs. 10a-c show the shell in three different aspects, natural size; figs. 10d-f are enlarged; d, shows the parietal and palatal arinatures from the posterior side; e, the inside of the outer wall with the palatal folds and denticles; and f, the parietal wall with its plate and folds.—(Ibid., iv, p. 231.)

NOTES.

Literature on the Anatomy of the Solenidæ.

I should be extremely obliged for any information or references to the literature treating of, or touching upon, the anatomy of the *Solenide*.—H. HOWARD BLOOMER, 35, Paradise Street, Birmingham.

On the dimensions of some *Arion empiricorum*, Fér.

In May last I collected near Sutton Coldfield two exceedingly large specimens of a black *Arion*. Feeling doubtful, from the size and prominent peripodial groove, if these were examples of *A. empiricorum*, Fér., I submitted one to Mr. W. E. Collinge, who has very kindly made a dissection of the same and pronounced it to be a large example of that species. The rugæ are large and prominent, the peripodial groove well marked by elongate rugæ, and the foot-sole has a sepia-coloured median plane, with rather lighter coloured lateral planes, with alternating broad and narrow transverse stripes. The measurements, taken when alive, were: length 22.5 cm.; foot-sole 3 cm. broad.—GUY BREEDEN, 304, St. Vincent Street, Ladywood, Birmingham.

New Locality for *Hygromia revelata*.

Mr. Howard Fox, of Falmouth, informs me that he has recently taken a living specimen of *Hygromia revelata* at St. Columb Minor, near Newquay, Cornwall. This is, I think, a new locality for the species.—B. B. WOODWARD.

Limax variegatus, Drap., var. *rufescens*, Moq., in Warwickshire.

A specimen of this somewhat uncommon variety was brought to me some few weeks ago from the cellar of a house in Edgbaston, Birmingham. On being placed in alcohol most of the red colour on the dorsum disappeared leaving only a small patch on the posterior end of the body.—WALTER E. COLLINGE (*Read before the M. M. S., August 12th, 1898*).

Slugs from North Devon.

I have recently received, through the kindness of Mr. F. J. Partridge, fifty-six specimens of *Amalia sowerbii*, Fér., from different localities in Nth. Devon, which are of interest as affording some idea of the great variation that exists in the external colouring of this species.

The following well-marked varieties were found:—

Var. *fuscocarinata*, Ckll., two specimens from Barnstaple. Var. *nigrescens*, Ckll., one specimen from the same locality, also a specimen of the var. *bicolor*, Ckll. There are numerous intermediate stages between the two last mentioned varieties, and a form similar in colouring to the Irish bocagei-like variety of *Arion empiricorum*, Fér.

The following seem to be new :—

Nigrocarinata, var. nov. Animal a very dark grey, with a deep black line running the whole length of the keel; foot-sole yellowish-white. Hab. Lynton, Nth. Devon. (Coll. of W.E.C.)

Plumbea, var. nov. Whole of dorsum and mantle a dark leaden grey, slightly lighter on the sides of the body; foot-sole ashy-grey. Hab. Barnstaple, Nth. Devon. (Coll. of W.E.C.)

Flavescens, var. nov. Sides of body yellowish, with light grey dorsally; foot-sole yellow. Hab. Lynton and Barnstaple. (Coll. of W.E.C.)

Mr. Partridge observed a specimen of *v. flavescens* pairing with *v. plumbea*.

With the above specimens there was also a very fine example of the var. *bicolor*, Moq., of *Arion empiricorum*, Fér., collected near Clovelly.—WALTER E. COLLINGE (Read before the M. M. S., October 14th, 1898).

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

A Meeting of a number of Malacologists was held on July 7th, 1898, in Mason University College, Birmingham, Mr. Walter E. Collinge, F.Z.S., in the chair, when the following resolutions were passed :—

- 1.—That a Midland Malacological Society be formed to foster a taste for the study of the Mollusca, which it will endeavour to carry out by means of
 - (a) meetings for the reading and discussion of papers, exhibition of specimens, &c. ;
 - (b) the formation of a library and collection ;
 - (c) the publication and circulation of such communications as are of permanent value.
- 2.—That Mr. H. Howard Bloomer be elected Secretary *pro tem*.

1ST MEETING, JULY 15TH, 1898.

Walter E. Collinge, F.Z.S., in the chair.

The Rules drawn up by the gentlemen present on July 7th were submitted, and after a few slight alterations were adopted as the Rules of the Society.

The following resolutions were passed :—

- 1.—That those who have signified to Mr. Bloomer their desire to join the Society, shall constitute the original Members.
- 2.—That the following constitute the first Council :—

President—Walter E. Collinge, F.Z.S.
 Treasurer—Guy Breeden.
 Secretary—H. Howard Bloomer.
 Other Members of Council—H. Willoughby Ellis, F. J. Partridge, Bromley Peckles, and G. Sherriff Tye.
- 3.—That the subscription for 1898 be 2s. 6d.

The Secretary read a letter from Mr. Geo. H. Morley, intimating that the Council of Mason University College had given their permission for the meetings of the Society to be held in the Zoological Department.

PAPERS READ.

“Notes on Formalin as a preservative fluid for Mollusca,” by H. H. Bloomer.

EXHIBITS.

By Mr. Collinge: Specimens of *Parmarion pupillaris*, Humb., *P. weberi*, Simr., and *Microparmarion gedeanus*, Simr., from Java; also a series of shells (*Anodonta Unio*, etc.) from China and Pegu.

By Mr. Guy Breeden: Two large specimens of *Arion empiricorum*, Fér., from Sutton Coldfield.

By Mr. H. H. Bloomer: Specimens of *Helix aspersa*, *H. nemoralis*, *H. hortensis*, etc., preserved in formalin.

By Mr. F. J. Partridge: Specimens of *Anodonta anatina*, with a series of varieties, from Sutton Coldfield; also from the same locality some large specimens of *Sphærium corneum*.

2ND MEETING, AUGUST 12TH, 1898.

The President in the chair.

The following nominations for membership were read:—

Messrs. E. R. Sykes, B.A., F.Z.S., and Robert Birbeck.

PAPERS READ.

"Description of a new Species of *Cryptosoma*," by Walter E. Collinge, F.Z.S.

"Preliminary List of the Land and Freshwater Mollusca in a twelve mile radius of Birmingham," by F. J. Partridge.

"*Limax variegatus*, Drap., var. *rufescens*, Moq., in Warwickshire," by Walter E. Collinge.

EXHIBITS.

By Mr. Collinge: A specimen of *Cryptosoma austeni*, and *Limax variegatus*, Drap., var. *rufescens*, Moq.

By Mr. F. J. Partridge: Specimens of *Helix aspersa*, and *H. nemoralis*, from Dorchester.

Mr. Guy Breeden made some remarks upon a collection of Canadian shells recently received.

3RD MEETING, SEPTEMBER 9TH, 1898.

The President in the chair.

The following were elected members of the Society:—

Messrs. E. R. Sykes, B.A., F.Z.S., and Robert Birbeck.

The following nominations for membership were read:—

Messrs. Bromley Peebles, J. W. Morton, W. Harrison, and J. E. Titley.

EXHIBITS.

By Mr. Guy Breeden: *Pisidium nitidum*, Jen., var. *lateralis*, Coles.

By Mr. Titley: A series of Canadian Freshwater Shells.

By Mr. Peebles: Two specimens of *Amalia gagates*, Drap., one approaching the var. *nigrescens*, Ckll., the other var. *fuscocarinata*, Ckll., both collected in a garden in Edgbaston, Birmingham.

By Mr. Bloomer: A series of molluscs preserved in 5 % formalin.

By Mr. Collinge: The following varieties of *Agriolimax agrestis*, L., *rufescens*, L. and P., *nigra*, Mor., *albida*, Pic., *sylvatica*, Moq., *lilacina*, Moq., and *reticulata*, Moq.

4TH MEETING, OCTOBER 14TH, 1898.

The President in the chair.

The following were elected members of the Society:—

Messrs. Bromley Peebles, J. W. Morton, W. Harrison, and J. E. Titley.

PAPERS READ.

"Slugs from North Devon," by Walter E. Collinge, F.Z.S.

"Further notes on Formalin as a preservative fluid for Molluscs," by H. Howard Bloomer.

Mr. Bloomer exhibited a large number of land and marine molluscs preserved in a 5 per cent. solution of Formalin, and stated that so far as tested it showed a decided advantage over alcohol as a preservative for museum specimens, nearly all of those exhibited being in as perfect a condition as when first put up three years ago. It was also to be observed that considerably less decolouration had taken place than in those preserved in alcohol.

Mr. H. Willoughby Ellis made some remarks upon the occurrence of *Helix rufescens*, Penn., in Warwickshire.

EXHIBITS.

By Mr. Collinge: A large collection of British *Sphaeriidae*, including all the known species and most of the varieties; also specimens of *Amalia sowerbii*, Fér., var. *nigrocarinata*, Cllge., var. *flavescens*, Cllge., both from Lynton, Nth. Devon, and var. *plumbea*, Cllge., from Barnstable, Nth. Devon, all collected by Mr. Partridge.

By Mr. Bloomer: Numerous land and marine molluscs preserved in a 5 per cent. solution of Formalin.

By Mr. F. J. Partridge: The following shells and molluscs recently collected in North Devon. *Helix virgata* with vars. *albicans*, Grat., *subalbida*, Poir., *hyalozona*, Taylor, *depressa*, Req., *minor*, Taylor, m. *sinistrorsum*, Taylor; *H. caperata* and vars. *ornata*, Pic., *fulva*, Moq., *obliterata*, Pic., *lutescens*, Pas., m. *scalariforme*; *H. hortensis* and vars. *lutea*, Moq., *lilacina*, Taylor; *Hy. draparnaldi*, *Testacella maugei*, *Amalia sowerbii* and vars. *fuscocarinata*, Ckll., *nigrescens*, Ckll., *bicolor*, Ckll., *plumbea*, Cllge., all from Barnstable.

From Braunton Marshes and "Burrows," *Succinea putris*, *S. elegans*, *Vitrina pellucida*, *Hyalinia crystallina*, *H. fulva*, *H. cellarius*, *Helix aspersa*, *H. hortensis*, *H. virgata* and vars., *albicans*, Grat., *radiata*, Hld., *H. caperata* and v. *ornata*, Pic., *H. hispida*, *H. rotundata*, *H. pulchella* and v. *costata*, Mull., *H. acuta* and vars. *alba*, Req., and *strigata*, Menke, *Pupa marginata*, *Vertigo antivertigo*, *V. moulinsiana*, *Cochlicopa lubrica*, and *Carychium minimum*.

From Lynton, *Amalia gagates*, *A. sowerbii* and vars. *nigrocarinata*, Cllge., *flavescens*, Cllge., and *plumbea*, Cllge., *Arion empiricorum* v. *bicolor*, Moq., *Limax maximus*, *L. marginatus*, *Helix arbustorum* v. *fuscescens*, D. & M., *H. nemoralis* and vars., *rubella*, Moq., and *castanea*, Moq., *H. hortensis*, *H. lapicida* v. *albina*, Menke., *H. rotundata* and v. *alba*, Moq., *H. hispida* v. *albida*, Jeff., *H. rufescens* and v. *alba*, Moq., *Balea perversa*, *Clausilia rugosa*, *C. laminata*.

CURRENT LITERATURE.

Acloque, A.—Faune de France. Tome iii. Paris, 1899 (1898). Des Mollusques, pp. 334-453, pls. 160-275.

M. Acloque's work is intended for students of general zoology rather than the specialist. Covering as it does the whole field of invertebrate zoology, it is not to be expected that it is free from errors, still in the pages treating of the Mollusca, these are remarkably few. The illustrations leave much to be desired, those of *Haliotis*, pl. 161, p. 344, *Limnea glabra*, pl. 195, p. 386, *Ancylus*, pl. 197, p. 387, and *Dendronotus*, pl. 223, p. 416, being very poor. The classification adopted is one we must dissent from, as it tends to hide the affinities between the different groups.—W. E. C.

Adams, L. E.—Observations on the pairing of *Limax maximus*, L. Journ. Conch., 1897, vol. ix, pp. 92-95, pl. 3.

A very interesting article, well illustrated.

Adams, L. E.—*Arion ater* var. *rubra*, Baud., new to Britain. Journ. Conch., 1897, vol. ix, pp. 112.

This is nothing more than the var. *lamareckii*, Kal., 1851, of *A. empiricorum*, Fér. Mr. Adams seems to like setting the law of priority at defiance.

André, E.—Organes de défense tégumentaires chez le *Zonites* (*Hyalinia*) *cellarius*, Gray. Zool. Anz., 1898, pp. 436-38.

André, E.—La fossette triangulaire caudate des Arions. Rev. Suisse de Zool., 1898, T. 5, pp. 179-81, fig. 1.

[Anon.]—Slugs. Nat. Science, 1898, vol. xiii, pp. 83-85.

A carefully written review of recent papers by W. E. Collinge. Malacology would make greater headway if all differences of opinion were as courteously expressed as here.

Burton, F. M.—*Testacella haliotidea* at Gainsborough. Nat., 1898, p. 320.

Cockerell, T. D. A.—Revision of the North American Slugs. Naut., 1898, pp. 47-48.

A short review of Messrs. Pilsbry and Vanatta's paper.

Collinge, Walter E.—Note on a new variety of *Testacella maugei*, Fér. Journ. Conch., 1898, vol. ix, p. 95.

“Var. nov. *nigra*, whole of body, foot-fringe, and foot-sole a deep black. Loc. Tenby, 1892 (A. H. Cooke), (Mus. Zool. Univ. Camb.).

Dall, W. H.—Note on the Anatomy of *Resania*, Gray, and *Zenatia*, Gray. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 85-86.

Godwin-Austen, H. H.—On *Philalanka*, a new sub-genus of *Endodonta*, with descriptions of two new species from the Indian region. Ibid., pp. 11-13, pl. 1.

The new species are *P. secessa* and *P. bolampattensis*.

Goodrich, E. S.—On the Reno-pericardial Canals in *Patella*. Quart. Journ. Micro. Sci., 1898, vol. xli, pp. 323-28, pl. 24.

After reviewing the work of previous writers the author describes the results obtained from an examination of a complete series of transverse sections, which show that in *P. vulgata* and *P. cerulea* “there are two reno-pericardial canals, opening by means of projecting ciliated funnels from the pericardium into the right and left kidneys respectively.”

Hedley, C.—Further notes on Australasian Shipworms. Proc. Linn. Soc., N.S.W., 1898, pp. 91-96, figs. 1-9.

A new freshwater species is described and illustrated, under the name of *Calobates fluviatilis* (Coll. of Aust. Mus.). *C. saulii*, Wright, is also dealt with, and there are some critical remarks on the generic status of these forms.

Hedley, C.—Descriptions of new Mollusca. chiefly from New Caledonia. Ibid., 1898, pp. 97-105, figs. 1-12.

The author describes a remarkable new species of *Placostylus* (*P. remotus*) from Dr. Cox's collection, aberrant both structurally and geographically, with some further observations on the range of the genus. The following new species are also described: *Ischnochiton araucarianus*, *Teinostoma oppletum*, *Diplommatina obesa*, *Rissoina angusta*, all in the collection of the Australian Museum.

Hedley, C.—Description of a new Bivalve, *Lima alata*, from Santa Cruz. Records Aust. Mus., 1898, vol. iii, pp. 84-85, fig.

Heynemann, D. F.—Zur Geschichte der Gattungen *Aspiloporus*, Fitzinger. Nachr. d. d. Malak. Gesell, 1898, pp. 108-11.

Joubin, L.—Note sur une nouvelle famille de Céphalopodes. Ann. de Sci. Nat., 1898 (ser. 8), T. vi, pp. 279-92, figs. 1-9.

The specimen here described—*Galiteuthis armata*, gen. et sp. nov.—is a pelagic form purchased in the Nice market. It is placed in a new family—*Cranchionychiæ*—in the Cegopsida division of the Decapoda.

Joubin, L.—Observations sur divers Céphalopodes. Bull. Soc. Zool. France, 1898, T. xxiii, pp. 101-13, 2 figs.

Prof. Joubin gives a very useful diagnostic key of the *Taonoteuthide* and describes *Grimalditeuthis richardi*, gen. et sp. nov.

Joubin, L.—Sur quelques Céphalopodes du Musée Royal de Leyde et description de trois espèces nouvelles. Notes Leyden Mus., 1898, vol. xx, pp. 21-28.

The three new species are *Octopus horsti*, *O. hoeki*, and *Sepiotheuthis sieboldi*.

M'Intosh, W. C.—On the Larval Stages of *Clione limacina*, Phips. Ann. and Mag. N. H., 1898 (7), vol. ii, pp. 103-5, pt. of pl. 2.

Mason, Geo. E.—*Agriolimax levis*, new variety. Sci. Goss., 1898, p. 157.

Mr. Mason describes a form much resembling the type in size and colour, with the mantle "very minutely mottled with rich dark red-brown, the colour being denser and more closely set in the centre and anterior portion. The sides in some examples are almost without trace of the mottling." [I have long had this interesting variation under the MS. name *rufrapunctatus*. It occurs in Warwickshire sparingly. I have also examples from Surrey.—W. E. C.]

Moore, J. E. S.—The Mollusca of the Great African Lakes. I. Distribution. Quart. Journ. Micro. Sci., 1898, vol. xli, pp. 159-80.

Moore, J. E. S.—The Anatomy of the Typhobias, etc. Ibid., pp. 181-204, pls. 11-14.

The anatomy of *Typhobia*, "probably the most remarkable freshwater Gasteropod at present known," is here described for the first time. A new family *Typhobiidæ* is proposed for the two known forms—*T. horei*, E. A. Sm., and *Bathanalia howesii*, Moore.

Typhobia is at once separated from any freshwater type, by the almost unique character of its nervous system. The gills are similar to those in *Strombus* and *Pterocera*, while in the characters of the alimentary system a similar relationship is indicated. Although the Typhobias can scarcely be termed archaic forms, they do possess undoubtedly archaic characters, such, for instance, as in the character of the otocysts and nervous system, in all other respects they appear to be allied to *Strombus* and *Pterocera*, retaining a more generalised type of foot and mantle. "They certainly possess none of those characters which would suggest that they can by any possibility be regarded as the persistent representatives of an old freshwater stock. They do, however, simulate and retain the characters of the nerves of the *Solarium* and the *Scalarids*, and they probably indicate the road by which the more modern marine genera of the *Strombide* and their associates have been evolved."

The paper is an exceedingly interesting one, and beautifully illustrated.—W. E. C.

Moore, J. E. S.—On the Hypothesis that Lake Tanganyika represents an Old Jurassic Sea. Ibid., pp. 303-21, pl. 23.

Moore, J. E. S.—The Marine Fauna in Lake Tanganyika and the advisability of further exploration in the great African Lakes. Nature, 1898, Aug. 25, pp. 404-8.

Oldham, C.—Abnormal example of *Limax flavus*. Naturalist, 1898, p. 240.

Refers to *L. variegatus*, Drap.

Paravicini, G.—Organi genitali anomali nell' *Helix pomatia*. Boll. Scient. Maggi, 1898, An. 20, pp. 39-44, T. 1.

Pfeiffer, W.—Über anatomische und histologische Bemerkungen über *Triboniphorus graeffei*, Humbert. Sitz. Gesell. naturf. Freunde Berlin, 1898, pp. 33-38.

Pilsbry, H. A. & Vanatta, E. G.—Revision of the North American Slugs. Proc. Acad. Nat. Sci. Phila., 1898, pp. 219-61, pls. ix-xvi.

This is the second part of a really valuable piece of work. It treats of the genera *Binneya*, *Hemphillia*, *Hesperarion*, *Prophysaon*, and *Anadenulus*. The paper is divided into the following parts:—1, Notes on the comparative anatomy of *Arionide*; 2, Classification; 3, Description of the genera and species; 4, Brief directions for collecting and preparing slugs.

The first part gives a clear and valuable account of the general anatomy of the different genera. We pointed out that in the earlier publication the authors used only the term "vagina" for the portion of the generative organs immediately preceding the vestibule, in this part we are pleased to note they have discriminated between the true vagina and the free-oviduct of Collinge.

Messrs. Pilsbry and Vanatta seem to have suddenly become aware of the fact, long known to European malacologists, that the pallial organs and muscular system are important factors in generic distinction. Seeing the first part of the "Revision" contains little or no mention of these parts, and that the senior author has contented himself with "oral armature" and even a shell without the animal in the past, the force of their remarks about "those who starve their souls on a mere study of the genitalia and oral armature, miss the best part of the feast," is somewhat lost. "Half a loaf is better than none," and in the *Arionide* the generative organs are likely to remain a very prominent feature for *specific* distinction. We quite agree with the remarks that it is upon the aggregate characters and not any single system that *generic* distinctions should be made. We miss in this first part, as throughout the whole paper, the references, so carefully given by European workers. We lay some stress upon this serious defect, as not a few American malacologists are rather fond of using and repeating the well known facts of German and English malacologists without giving any credit to the original describers.

Of part 2 we cannot speak too highly, it is thoroughly and carefully done, and must for some time remain the best classification that has yet been given of the *Arionide*. The family is divided into three sub-families, viz.: *Binneyiæ*, Ckll., *Ariolimacinae*, P. and V. *nov.*, and *Arioninae*, W. G. Binney. Here again the authorities are not mentioned. There are eight genera recognised, the genus *Phenacarion*, Ckll., 1890, being rightly omitted.

The descriptions of the genera and species in part 3 is characterized by the same care and thoroughness so evident in part 2. Want of space only forbids us to direct attention to the numerous points of interest in the same. Messrs. Pilsbry and Vanatta have in the two published parts of the "Revision" given to malacologists an admirable guide to the American slugs, far and away the most important yet published. We trust it will serve as an impetus to American students, and be the means of training a series of broad and open minded malacologists, ever ready to welcome and acknowledge the work of others, and upon disputed points to agree to differ in all friendliness.—W. E. C.

Pilsbry, H. A.—Phylogeny of the Genera of *Arionide*. Proc. Mal. Soc. Lond., 1898, vol. iii, pp. 94-104, pl. vii.

We are indebted in this paper to Professor Pilsbry for a careful description, with figures, of the anatomy of *Anadenus ultivagus*, Theob., which corrects and amplifies the earlier description of Godwin-Austen; and also for a most interesting account of the phylogeny of the different genera of *Arionide*.

As affording the most fundamental characters for the primary division of the *Arionide*, Professor Pilsbry selects the modifications of the free muscles. These myological features in the different genera are carefully described and compared. From a study of the anatomy the author concludes that the genus *Anadenus* is a much more primitive one than any of the European *Arionide*. In the form and

position of the muscles and intestine it resembles the American genus *Prophysaon*, but differs in possessing a penis, showing an affinity in this character, with *Hesperarion*. In the more primitive genera of *Arionidae* e.g. *Ariolimax*, the pharyngeal and ocular retractors approach the condition found in the *Limacidae*.

Prof. Pilsbry is of opinion that the *Arionidae* "not only do not possess the characters of primitive shell-less forms, but the series of recent genera unmistakably indicate their descent from a group with well-developed spiral shell," in fact we must look to the *Endodontidae* for the ancestral root of the *Arionidae*.

Although there will be much difference of opinion as to the conclusions reached by Prof. Pilsbry, the paper is an important one, and full of points of interest, which are worth working out in greater detail than has here been attempted.—W. E. C.

Pilsbry, H. A. & Vanatta, E. G.—Materials toward a natural Classification of the Cylindrelloid Snails. Proc. Acad. Nat. Sci. Phila., 1898, pp. 264-86, pls. 17-18.

Rath, O. vom.—Fehlen den Sexualzellen der Zwitterdrüse von *Helix pomatia* die Centralkörper? Zool. Anz., 1898, Bd. 21, pp. 395-6, 413-15.

Dr. vom Rath describes in the sex-cells of *H. pomatia* distinct central corpuscles which are clearly visible in the quiescent stage and also in mitosis.

Rawitz, B.—Die Fussdrüse von *Gasteropteron meckelii*, Kosse. Internat. Monatschr. f. Anat. u. Phys., 1898, Bd. 15, pp. 199-205, 2 figs.

Rolle, H.—Eine neue *Pomatia*. Nachr. d. d. Mal. Gesell., 1898, pp. 91-92. [*P. pelagonesica*.]

Simroth, H.—Ueber muthmassliche Mimicry beim japanischen *Philomyces*. Ber. d. Naturf. Gesell. Leipz., 1897 (1898), pp. 3-7.

Simroth, H.—Ueber die Gattung *Limax* in Russland. L'Ann. du Mus. Zool. d. l'Acad. Imp. of Sc. St. Petersburg., 1898, pp. 52-67.

Short descriptions of the following new species of Russian Limaces are given:—*L. turkestanus*, *L. daghestanus*, *L. ananovi*, *L. caucasicus*, *L. amalioides*, *L. colchicus*, *L. simplex*, *L. valentini*, *L. baeri*, and *L. retowskii*.

Standen, R.—Mollusca. Irish Field Club Union. Kenmare Conference. Irish Nat., 1868, pp. 218-29, 1 pl.

Unlike the majority of lists of shells, this contains much interesting information on the habitats and distribution of various species.

Suter, H.—Revision of the New Zealand *Rissoiidae*. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 1-8, figs. 1-5.

R. hamiltoni, *R. fumata*, *R. lubrica*, *R. foveauziana*, and *Barleeia neozelanica*, are new (Coll. of H. Suter).

Sykes, E. R.—Description of two new species of *Clausilia* from the Province of Che-kiang, China. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 63-64, figs. 1-2. *C. timaltha* and *C. labyrinthoides*, both from Kiu-chau.

Sykes, E. R.—List of the Species *Cataulus* found in Ceylon, with descriptions of some new land-shells from that island. Ibid., pp. 65-75, pl. v.

Sykes, E. R.—The Zoological Record, London, 1898. Record vii, Mollusca pp. 1-78.

Mr. Sykes, assisted by Messrs. E. A. Smith and G. C. Crick succeeds Mr. B. B. Woodward, one of the most able recorders that has been connected with this invaluable publication.

The classification adopted is that so carefully planned by Mr. Woodward, with this deviation, the groups of the *Helicidae* have been suppressed, thereby making

reference much easier. Further the full titles of Palæontological papers are given and the new Fossil genera and sub-genera are noticed in the systematic portion. If in future volumes the year of publication of various papers, etc., were given, in addition to the volume, it would greatly add to the value of the work which has been well and carefully done, and must, as hitherto, prove of the greatest value to every student of the Mollusca.

EDITOR'S NOTES.

It has been suggested to us that the addition of an American Malacologist to our list of Editorial colleagues would be very agreeable to workers in the United States. We need scarcely say we should heartily welcome the addition.

During the past year an active and vigorous society has been founded in Birmingham, under the title of "The Midland Malacological Society," full particulars of which will be found in its "Proceedings," published in the present number of this Journal.

There are now in Great Britain three distinct societies devoted to the study of the Mollusca. The first, "The Conchological Society," founded in 1876, with its head-quarters first at Leeds, and now at Manchester, has branches at Leeds and London, and publishes its "Proceedings" in the "Journal of Conchology."

"The Malacological Society of London," founded in 1893, has rapidly risen to be one of the most important and successful of the Learned Societies. Its admirable "Proceedings," and the general success which has attended it, being very largely due to the untiring and devoted efforts of Messrs. B. B. Woodward and E. R. Sykes.

"The Midland Malacological Society," which has just completed its first year of existence, bids fair to become a strong provincial society. Its "Proceedings" will be published in this Journal.

It is to be sincerely hoped that these societies and their various branches may all work together amicably, and that no spirit of unfriendliness or little-minded jealousy may ever be fostered. Each has its own sphere of usefulness and tends to increase and diffuse our knowledge of the Mollusca.

Some little time ago Mr. John Grant, the well known publisher of Edinburgh, offered to reprint a limited number of copies of volume I of this Journal in demy octavo, in order that the set of volumes should be uniform in size. To this generous proposal we readily agreed, and we have now great pleasure in directing attention to the fact.

Mr. Grant has the whole of the remainder of all the published parts from volume I (1891) to volume VI (1897). The number of these complete sets is limited and will, no doubt, be eagerly sought after by Librarians and others.

We regret to have to record the death of Félix Bernard, at the early age of 35. Bernard was well known to all students of the Mollusca by his series of papers on the hinge of bivalved molluscs. By his decease the Paris Museum loses a zoologist of great promise.

At a meeting of the Midland Malacological Society, held on November 11th, 1898, Professor W. C. McIntosh, M.D., LL.D., F.R.S., Mr. Edgar A. Smith, F.Z.S., and Professor Heinrich Simroth, were, on the unanimous recommendation of the Council, elected Honorary Members of the Society.

Fig. 1.

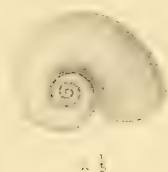


Fig. 3.

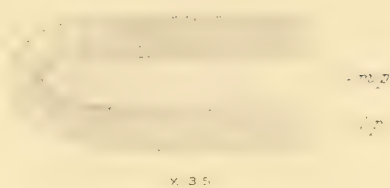


Fig. 2



Fig. 4.

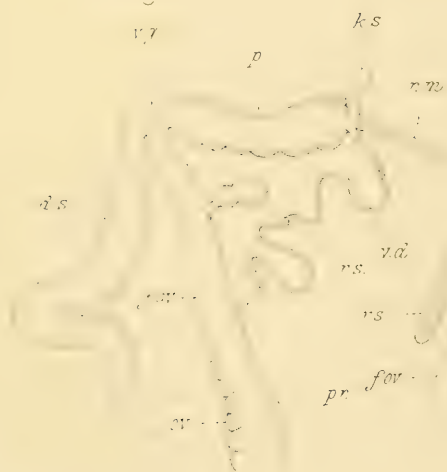
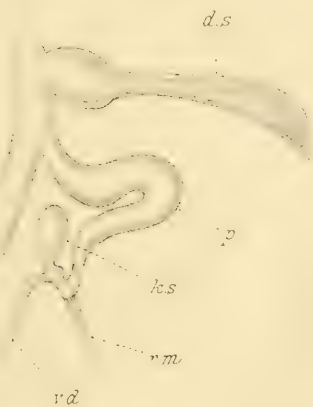


Fig. 5.



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THE SPECIFIC POSITION OF THE REPUTED BRITISH HYALINIA GLABRA, STUDER.

By W. MOSS, F.C.A.,

Ashton-under-Lyne.

THIS British species was on the authority of the late Gwyn Jeffreys in 1870 separated from *Hy. alliaria* and declared to be identical with the continental *Hy. glabra* of Studer. Its identity with the continental species has been frequently disputed, and Mr. L. E. Adams in his last edition of "*British Land and Freshwater Shells*" discards "*glabra*" and substitutes *helvetica*, Blum., as the name of the species, stating as his reason for so doing that—"Investigation has at last settled the dispute as to what the species we have been accustomed to call *glaber* was called on the continent. It appears to be the *helvetica* of Draparnaud, as Mr. Taylor had suspected many years ago."

Unfortunately Mr. Adams does not tell us where the reputed British *glabra* differs from its continental namesake, nor what the characters are which agree with the continental *helvetica*.

Recently, through the kindness of Professor Simroth, the writer has had the opportunity of examining a single specimen of *Hy. glabra*, Studer, and two specimens of the same species kindly forwarded by Dr. Babor of Prague. After comparing the radulæ and generative organs of these three specimens, with those of a very large series of the British form, there can be no question that whatever the reputed British *glabra* may ultimately prove to be, it is quite distinct from the *glabra* of Studer. The reasons for this conclusion will be set forth in a later contribution.

NOTES ON THE SPECIES OF ENNEA AND LEPTOPOMA RECORDED FROM CEYLON, WITH DESCRIPTIONS OF SOME NEW LAND-SHELLS FROM THAT ISLAND.

By E. R. SYKES, B.A., F.Z.S.

(Plate II.)

THE only two forms of *Ennea* recorded from Ceylon are *E. bicolor* (Hutton) and *E. ceylanica* (Pfr.). These are, I think, one and the same species, for which the former name has precedence. The species was collected at Galle and Trincomalie by Mr. Preston; at the latter locality he also found a single specimen which I was unable for some time to identify. Mr. Blanford kindly examined it and suggested that it might be a form of *E. stenostoma* (Bedd. MS.) Blfd., described from Madras. I have compared the single shell with the specimens of that species in the British Museum, and except for the Ceylon specimen being a trifle larger, I am unable to arrive at any distinguishing characteristic.¹

Leptopoma.

The species already recorded from Ceylon, belonging to the *Leptopoma* group are the following:—

Leptopoma elatum (Pfr.).

Cyclostoma elatum, Pfr.: Proc. Zool. Soc., 1852 [1854], p. 159; Conch. Cab., 1853, *Cyclostomacea*, p. 246, pl. xxxii, figs. 16, 17.

Leptopoma elatum, Pfr.: Mon. Pneum. Viv., 1852 [? 1853], p. 117; Reeve, Conch. Icon., *Leptopoma*, sp. 3; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 2.

Hab.—Ceylon.

Only known to me from the original series in the British Museum: it is a somewhat carinate shell, of a "Philippine form," belonging to the group of *L. atricapillum*, Sby., and *L. regulare*, Pfr.

Leptopoma semiclausum (Pfr.).

Cyclostoma (Leptopoma) semiclausum, Pfr.: Prof. Zool. Soc., 1854 [1855], p. 302.

¹ Since the above was written, Mr. Blanford has informed me that *E. stenostoma* is probably identical with *Pupa planguncula* of Benson.

Leptopoma semiclausum, Pfr. : Reeve, Conch. Icon., *Leptopoma*, sp. 35 ; Hanley and Theobald, Conch. Ind., pl. vi, fig. 2.
Hab.—Ceylon (Thwaites).

Leptopoma apicatum, Benson.

Leptopoma apicatum, Bens. : Ann. Nat. Hist., 1856, (2) xviii, p. 95 ;
 Reeve, Conch. Icon., *Leptopoma*, sp. 33 ; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 1.

Hab.—Ceylon (Layard).

The single specimen in the British Museum, apparently correctly identified, and figured as above mentioned, is a very dead shell : it may possibly prove to be only a form of the last species.

Leptopoma (Leptopomatoides) halophilum (Bens.).

Cyclostoma halophilum, Bens. : Ann. Nat. Hist., 1851, (2) vii, p. 265 ; Pfeiffer, Conch. Cab., *Cyclostomacea*, p. 241, pl. xxxi, figs. 29—31.

Leptopoma halophilum, Bens. : Reeve, Conch. Icon., *Leptopoma*, sp. 49 ; Hanley and Theobald, Conch. Ind., pl. vi, fig. 3.

Hab.—Galle (Benson) ; Colombo (Templeton) ; Maturata (Jousseume) ; Galle, Colombo, Trincomalie, Ratnapura at 1000 feet (Preston).

A single specimen, kindly lent me by Col. Beddome, which I am unable to separate from this species, was found "on Pedro."

I have elsewhere¹ dealt with the history of the subgenus *Leptopomatoides* : since writing I have discovered that Prof. von Martens² appears to have been the author who first put the name forward as a subgenus and therefore it should stand as *Leptopomatoides*, Martens. It may prove useful as a name for this compact little Ceylon group, and appears to also include a few outlying species from China, etc.

Leptopoma (Leptopomatoides) orophilum (Bens.).

Cyclostoma orophilum, Bens. : Ann. Nat. Hist., 1853, (2) xi, p. 106.

Leptopoma orophilum, Bens. : Reeve, Conch. Icon., *Leptopoma*, sp. 51 ; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 4.

Cyclostoma (Leptopoma) pacillum, Pfeiffer : Proc. Zool. Soc., 1854 [1855], p. 302.

¹ Proc. Malac. Soc., vol. iii, p. 66.

² Zool. Rec., 1878, Moll., p. 78.

Leptopoma pacillum, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 46.

Hab.—Monahagalla (Layard); Rupaha, Uda Pussellawa (Preston); Ambagamuwa (Collett).

***Leptopoma (Leptopomatoides) flammeum* (Pfr.).**

Cyclostoma (Leptopoma) flammeum, Pfeiffer: Proc. Zool. Soc., 1854 [1855], p. 127.

Leptopoma flammeum, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 47; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 3.

Hab.—Ceylon (Layard).

The specimens constituting the original series are not in good condition and this species may prove to be a variety of the last.

***Craspedotropis conulus* (Pfr.).**

Cyclostoma (Leptopoma) conulus, Pfeiffer: Proc. Zool. Soc., 1854 [1855], p. 127.

Leptopoma conulus, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 45; Hanley and Theobald, Conch. Ind., pl. cv, fig. 1.

Hab.—Ceylon (Thwaites); Ambagamuwa (Collett).

I have placed this in *Craspedotropis*,³ as it appears to be akin to the type species *C. cuspidatus*, Bens.: the name was proposed as a subgenus of *Cyclophorus*, but has recently been raised to the position of a distinct genus by Kobelt and Moellendorff.

The following names appear in Nevill's "*Enum. Helic. et Pneum. Ceylon*," but no descriptions were published; *Leptopoma alticolum*, *L. raditicolum*, *L. setiferum*. In Reeve's monograph of *Leptopoma* the habitat of *L. conicum*, Pfr., is given as "Ceylon (Thwaites)": when first published⁴ no locality was given, subsequently Pfeiffer gave "Cochin-China," and probably this is more correct, and Reeve's localization was due to an error.

***Lagochilus occultus*, n. sp. Pl. ii, fig. 6.**

Testa mediocriter et perspective umbilicata, elate turbinata, tenuiuscula, brunneo-cornea, spira bene elevata; anfr. $4\frac{1}{2}$ —5 convexi, sutura profunde impressa, periostraco bene induti, lineis spiralibus (ultimus sex approx.) et transversis, et setis sparsim notati, basi usque in umbilicum leviter lirati; apertura subcircularis, peristomate leviter incrassato, superne leviter exciso. Alt. 2.5, diam. 4 mm.

Hab.—Ambagamuwa (Collett).

³ Blanford: Ann. Nat. Hist., 1864, (3) xiii, p. 454.

⁴ Proc. Zool. Soc., 1859, p. 27.

This, the first species of the genus recorded from Ceylon, is an interesting little shell, clothed with a dense periostracum, which forms transverse and spiral lines, the latter having a few hairs scattered along them. Neither of my specimens—though otherwise in good condition—has the operculum. The notch is small but distinct. Col. Beddome has lent me a series of specimens which I am unable to separate from this form and which were collected "on Pedro, at 6000 feet."

Cyclophorus vescus, n. sp. Pl. ii, fig. 3.

Testa mediocriter umbilicata, depresso-turbinata, solidula, brunneo-cornea, ad suturam et usque ad peripheriam maculis castaneis picta, periostraco levissime induta, apice obtusulo, sutura valde impressa; anfr. $4\frac{1}{2}$ —5, sat rapide accrescentes, convexi, primi fere laeves, reliqui spiraliter striati, lineis incrementibus leviter notati; Apertura subcircularis, superne angulata, peristomate leviter incrassato, reflexiusculo; operculeum corneum, tenue, multispirale. Alt. 5.75, diam. 10.5 mm.

Hab.—Ambagamuwa (Collett).

Var. *a.* Minor, pallidior. Alt. 4, diam. 8 mm.

Hab.—Uda Pussellawa (Preston).

Though a small species, I find it impossible to remove this from the typical group of *Cyclophorus*, to any of the sections and genera which have been gradually separated. The shell is of the ordinary turbinate form, marked with spiral lines which become less conspicuous on the last whorl. A specimen in the collection of Col. Beddome measures 12 mm. in diameter.

Cyclophorus binoyæ, n. sp. Pl. ii, fig. 4.

Closely related to *C. vescus*, but the spiral striation is very much finer, the lines being more numerous and closely set, the periostracum much stronger, being almost scabrous; the shell is also more closely coiled, a specimen of $4\frac{1}{2}$ whorls measuring only: alt. 3, diam. 5 mm.

Hab.—Binoya, Ambagamuwa (Collett).

Cyathopoma innocens, n. sp. Pl. ii, fig. 2.

Testa turrita, elongato-pyramidalis, perspective umbilicata, apice obtusulo; anfr. $4\frac{1}{2}$ —5, lente accrescentes, valde convexi, sub lente lineis incrementibus parvis notati, sutura valde impressa; apertura circularis; operculum multispirale, medio concavum. Alt. 1.65, diam. 1.2 mm.

Hab.—Eton Estate, Punduloya, at 4000 feet (Collett).

This minute speck, which appears to be adult, has no salient

characters. The periostracum seems absent and there is no sculpture beyond the lines of growth; the suture is very deep and the whorls very convex. It belongs to the group of *C. turbinatum*, Sykes, but is much smaller, and more elevated in proportion to its breadth; the umbilicus is also narrower.

Cataulus greeni, n. sp. Pl. ii, fig. 5.

Testa conspicue sed anguste rimata, elongato-pyramidalis, solidula, eleganter costulato-striata, apud suturas crenulata, pallide straminea, spira producta, apice obtusiusculo; sutura valde impressa; anfr. 8, plano-convexi; carina umbilicalis valida, acuta; periomphalum magnum, costulato-striatum; apertura subcircularis; peristoma album, continuum, duplex, externum incrassatum et valde reflexum, internum productum, margine dextro apud medium sinu exciso notatum basi productum, canali mediocri perforatum. Alt. 17, diam. 6 mm.

Hab.—Pundwloya, at 4000 feet (coll. E. C. Green, dedit Collett).

A very remarkable form, differing from all other known Ceylon species of the genus in having a sinus or notch in the upper dextral margin, in addition to the usual perforation at the base. I have much pleasure in dedicating it to Mr. Green, through whose energy it was discovered.

Kaliella colletti, n. sp. Pl. ii, fig. 1.

Testa elongato-pyramidalis, subperforata, cornea, nitidula, apice flavido, acutulo, basi subimpresso regione umbilicali; anfr. 8, planiusculi, primi rapide, reliqui lente accrescentes, sub lente obscure longitudinaliter striati; sutura impressa; apertura quadrata, margine dextro acuto, columellari subreflexo. Alt. 3.85, diam. 2.1 mm.

Hab.—On bamboo, orange, and mango trees, Binoya, at 3600 feet, Ambagamuwa (Collett).

The breadth increases rapidly in the earlier whorls, but slowly in the later whorls, thus giving an elongated appearance to the shell. It is a much more slender shell than *K. salicensis*, G.-Austen, which Mr. Collett found with it, and is not so sharply keeled as that species. From *K. delectabilis* and *Sitala operiens*, it is similarly distinct in form and may be severed from the last-named also by the absence of spiral sculpture.

EXPLANATION OF PLATE II.

Fig. 1. *Kaliella colletti*.

„ 2. *Cyathopoma innocens*.

„ 3. *Cyclophorus vesus*.

Fig. 4. *Cyclophorus binoya*.

„ 5. *Cataulus greeni*.

„ 6. *Lagochilus occultus*.

Since the size-lines marked in the figures (except fig. 5) differ from the dimensions given, it may be remarked that the latter are taken from the apex to the umbilical area.

PHASIANELLA "PULLA" OR "PULLUS"?

BY THE REV. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

SOME uncertainty appears to prevail with regard to the meaning of the specific name *pullus*, as applied by Linné to a common British shell, which he regarded as a *Turbo*, but which is now universally classified as *Phasianella*. Thus Forbes and Hanley, regarding the specific name as a substantive (and meaning "chicken"), write *Ph. pullus*, while Jeffreys on the other hand regards it as an adjective, writes *Ph. pulla*, and translates "dark-coloured" (*Brit. Conch.*, iii, p. 338).

An examination of the "*Systema Naturae*" appears to set this vexed question at rest. If we turn to the tenth edition—which is now recognised as the authority for nomenclature—a very short examination of the specific names at the left-hand side of the text leads to the conclusion that it was the habit of Linné, when he designated a species by the name of a substantive in the nominative singular, to print it with a capital letter.¹ Thus we have on page 706 *Mytilus Modiolus* and *M. Hirundo*; on p. 757 we have *T. rochus Magnus* and *T. Modulus*; on p. 765 we have *Turbo Clathrus*, *T. Uva*, and *T. Lincina*, etc., etc.

On the other hand, when he designated a species by an adjective in the nominative case, he printed it with a small initial letter. Thus on the pages already referred to we have (on p. 706) *Mytilus cygneus*, *anatinus*, *viridis* and *ruber*, (on p. 757) *Trochus perspectivus*, *hybridus*, *cruciatus* and *pharaonius*, (on p. 765) *Turbo crenatus*, *lacteus*, *striatulus*, *carneus* and *reflexus*. And what he printed in this particular case was not *Turbo pullus*, but *Turbo Pullus* (p. 761).

No one can have studied the text of the "*Systema*" without discovering that Linné was not distinguished for extreme accuracy, either in his references to other authors or in adherence to his own rules. Thus we should expect to find exceptions to the rule above indicated. As a matter of fact we do so, and in several cases these exceptions are the result of mere carelessness, thus tending to confirm rather than contradict our conclusion. We find, for instance, a few substantival specific names written with a small initial letter, e. g. *Nautilus fascia* (p. 711), *Strombus urceus* (p. 745), but in the twelfth

¹ Probably following the custom of the Germans, and nations allied to the Germans, of writing all nouns substantive with a capital.

edition these are corrected to *Fascia*, *Urceus*. Conversely we have *Turbo Scalaris* (p. 764), *Bulla Fontinalis* (p. 727), and *Helix Citrina* (p. 771), in edition 10, corrected to *scalaris*, *fontinalis*, and *citrina* in edition 12. Occasionally these mistakes escape detection in edition 12, and are not corrected till Gmelin's edition, known as the thirteenth.² Such are *Strombus Lentiginosus* (ed. 10, p. 743) *Turbo auriscalpium* (p. 767), *Helix Vivipara* (p. 772), *Dentalium Elephantinum* (p. 785), *Patella unguis* (p. 783). Sometimes, e. g. *Helix Auricularia*, they escape Gmelin as well.

It is remarkable that when the substantive is in the genitive plural, Linné writes it with a small initial, e. g. *Turbo muscorum* (p. 767), *Mya pictorum* (p. 671), *Helix arborum* (p. 771), *H. lucorum* (p. 773). When however in these cases the substantive is itself used as a scientific term he writes it with a capital, e. g. *Bulla Hypnorum* (p. 727). So to with adjectives he writes *Buccinum Neriteum* (p. 738), *Turbo Neritoides* (p. 761), *Patella Neritoidea* (p. 781), *Helix Haliotoidea* (p. 775), but *Helix itala*, *balthica*, *hispana*, *Patella chinensis*, *ungarica*, *graeca*, *Conus ebraeus*, etc.

One more point might be added, in confirmation of the view that *pullus* is a noun substantive. Linné frequently repeats his specific names, thus he uses *Nucleus* to designate an *Arca* (p. 695) and a *Cypraea* (p. 724), *Hirundo* to designate a *Mytilus* (p. 706) and a *Cypraea* (p. 722), *Legumen* for a *Solen* (p. 672), and a *Nautilus* (p. 711), *Erinaceus* for a *Buccinum* (p. 736) and a *Murex* (p. 748). It so happens that he uses *Pullus* once again to designate a mollusc, for on page 737 we find *Buccinum Pullus*. It is obvious that, if he had intended the word to be used as an adjective, he would have written *Buccinum pullum*.

² Linné writes *Conus Minimus* and *Rusticus* in both ed. 10 and 12, possibly regarding the names as nouns substantive. Gmelin thought otherwise with regard to the first, and writes *minimus*, but keeps *Rusticus*.

ON THE OCCURRENCE IN IRELAND OF ARION EMPIRICORUM, FÉR., VAR. BOCAGEI, SIMR.

BY WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

THE interesting variety of *Arion empiricorum*, Fér., known as *bocagei*, was described by Simroth in 1891.¹ It is a Portugese form, and differs from any recorded variety occurring in the British Isles, in having a pale yellowish dorsum with sepia coloured sides. I have placed on record a series of forms, found in the British Isles, closely approaching it², viz.—

“Subvar. nov.—Sides blackish, back grey; margin of sole light-yellow. Ireland (Scharff.).

Subvar. nov.—Sides blackish, back light bluish grey; foot whitish, margin of sole white. Yorkshire (Collinge.).

Subvar. nov.—Sides blackish, back greyish; margin of sole light-brown. Yorkshire (Collinge.).

Subvar. nov.—Animal drab colour; foot deep yellow, margin bright orange. Guernsey (Roebuck.).”

Since the above descriptions were published, similar variations have been sent to me from various parts of the British Isles, and I have made careful examinations of many hundreds of specimens in connection with the variation of this species, but not until a few weeks ago have I seen any form more closely approaching those figured and described by Simroth. Through the kindness of my Irish friends I have been favoured with large quantities of this species from the south and south-west of Ireland, and in a recent consignment of some forty examples collected near Cork, there was one specimen identical in all external features with the var. *bocagei*, Simr. A dissection of the generative organs showed no variation from the typical black forms. Nearly all the remaining specimens were normal, excepting two, which agree very closely with the example figured by Dr. Scharff,³ and a single specimen of the var. *hibernus*, Mab.

The occurrence of the variety *bocagei* in the south of Ireland and in Portugal, relegates it, so far as distribution is concerned, to the same category as that of *Geomalacus maculosus*, Allm. Of course it would be unwise to draw any conclusions from the occurrence of a single specimen, but the same seemed worthy of recording in the hope that Irish malacologists would keep a look out for any similar forms in the future.

¹ Nova Acta, 1891, Bd. lvi, p. 347, T. xiii, figs. 1a, 1b.

² Ann. and Mag. N. H., 1892, vol. 9 (ser. 6), pp. 307-8.

³ Trans. Roy. Dublin Soc., 1891, vol. iv (ser. ii), p. 560, pl. lvi, fig. 16.

SPECIES OF PLECTOPYLIS RECENTLY DESCRIBED IN "SCIENCE GOSSIP."¹

By G. K. GUDE, F.Z.S.,

London.

Plectopylis blanda, Gude.

Shell sinistral, depressed conical, widely and deeply umbilicated, whitish-corneous, finely and regularly ribbed. Spire conical, apex prominent, suture distinctly impressed. Whorls six, tumid above, rounded below, increasing very slowly and regularly, the last not descending in front, angulated above the periphery and round the wide perspective umbilicus. The cuticle is produced into deciduous hairs on the ribs, forming spiral rows. Aperture oblique, lunate, a little flattened on the upper, outer margin. Peristome white, a little thickened and reflexed, the margins united by a slight, flexuous ridge on the parietal callus. Parietal wall with a strong, vertical plate, slightly deflected anteriorly and having two minute denticles posteriorly, the upper vertically the lower horizontally elongated. A very thin horizontal fold occurs below the vertical plate and a very short fold above it. Palatal folds in two series; the anterior consisting of six thin horizontal folds, the first and sixth a little shorter and placed a little further back than the other four; the posterior series consists of four very short folds or denticles.—Major diameter, 6 mm.; minor diameter, 5 mm.; altitude, 3 mm.

Hab.—Naga Hills, Assam. Type in my collection.

A single specimen received by the writer under the name of *Plectopylis minor*, from the Naga Hills, was sent to Lieut.-Col. Godwin-Austen for examination, and was found by him to be a new species.

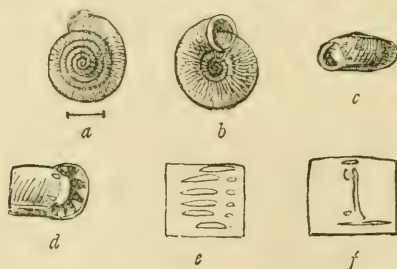


Fig. 11.—*Plectopylis blanda*, Gude.

It differs from *Plectopylis minor* in being larger and more elevated, and having a wider and deeper umbilicus. The parietal armature differs in having an additional fold above the vertical plate, and the anterior denticles are almost united to this fold. The palatal armature differs in the posterior folds being very short and almost reduced to denticles. Figs. 11 *a-c* show the shell in three different aspects. Fig. 11 *d* gives the posterior view of the two armatures; *e*, the inside of the outer wall; and *f*, a portion of the parietal wall, with its plate and folds. All the figures are enlarged.—("Science Gossip," iv, p. 264.)

***Plectopylis trochospira* var. *boholensis*, Gude,**

differs from the type in being smaller and having a narrower umbilicus. Major diameter, 3.25 mm.; minor diameter, 3 mm.; altitude, 1.75 mm.

Hab.—Bohol Island, Philippine Islands. Type in Mr. Ponsonby's collection.

Two specimens kindly lent to me by Mr. Ponsonby, labelled with the manuscript name, "*Plectopylis trochospira* var. *boholensis* (Möllendorff)," certainly represent a distinct variety. They are smaller than the type, and the umbilicus is narrower. The



Fig. 12.—*Plectopylis trochospira* var. *boholensis*, Gude.

armature is nearly identical, but the palatal folds are connected at their posterior terminations by a very slight transverse sinuous ridge, plainly discernible externally through the shell-wall.—(Ibid., p. 285.)

***Plectopylis achatina* var. *obesa*, Gude.**

Differs from the type in being more compressed and higher in proportion to the diameter; in the last whorl not widening suddenly at the aperture, and in the lower side sloping from the periphery to the umbilical angulation; the right margin of the peristome is depressed;

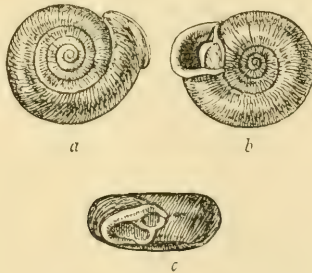


Fig. 13.—*Plectopylis achatina* var. *obesa*, Gude.

the umbilicus is deeper, and the horizontal median parietal fold does not quite reach the apertural ridge. The shell is darker in colour and more strongly ribbed.—Major diameter, 19 mm.; minor diameter, 15 mm.; altitude, 7 mm.

Hab.—Moulmain, Burma. Type in my collection.

Is darker in colour than the type, being of a fuscous chestnut. It is more compressed and distinctly ribbed; the shell is higher in proportion to the diameter, and the umbilicus is deeper; the last whorl does not widen suddenly, and the right margin of the peristome is depressed, the aperture being consequently somewhat ear-shaped; the lower side slopes from the peripheral region to the umbilical angulation. The armature does not differ materially from that of the type, except that the median horizontal parietal fold does not quite reach the apertural ridge. Six specimens were received by me from Miss Linter, five of these being more or less decorticated.—(Ibid., v, p. 115.)

Plectopylis achatina var. *infracasciata*, Gude.

Differs from the type in being more rounded in contour, and in the last whorl not widening at the aperture; the umbilicus is more shallow and the peristome more flattened and reflexed; the right margin is a little depressed; the shell is blackish or purplish brown above, with a white or bluish white band below, reaching from the umbilical angulation to the lower suture; the peristome is purplish brown, the left margin being paler.—Major diameter, 22 mm.; minor diameter, 18 mm.; altitude, 8 mm.

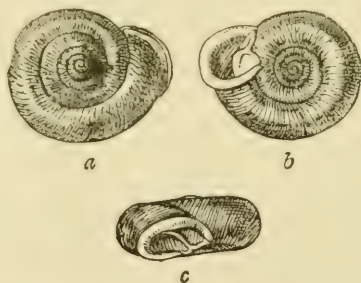


Fig. 14.—*Plectopylis achatina* var. *infracasciata*, Gude.

Hab.—Limestone Rocks, Moulmain, Burma. Type in my collection.

Is still darker than the variety *obesa*, being of a blackish or purplish brown. Like that variety it is rounded in contour, but it is larger and more flattened; while the umbilicus is a little more shallow and

the peristome more flattened and reflexed than in the type. The peristome is livid purplish in colour, the left margin being paler and the right margin a little inflected. A whitish or bluish-white band below reaches from the umbilical angulation to the lower suture. The armature is similar to that of the type, but the horizontal parietal fold near the lower suture is visible from the aperture and terminates close to the ridge. The specimen figured was received by me from Mr. Robert Cairns. Four specimens in the collection of Mr. E. L. Layard and one specimen in the McAndrew collection (the latter labelled "*Plectopylis refuga*") all belong to this form. The shell figured in Hanley and Theobald's "*Conchologia Indica*," t. 57, f. 8 and 9, and Martini und Chemnitz "*Conchylien Cabinet*" (2) i. t. 66, f. 28-30 (from Mergui, Burma), I also refer to this variety. A specimen measuring 21 mm. in diameter is in the collection of Mr. Cairns, who also possesses four immature shells in various stages of growth, all showing sets of barriers similar to that of the immature *P. achatina* shown in fig. 81 a. "*Sci. Gos.*" v, p. 114.—(Ibid., p. 138.)

Plectopylis achatina var. *venusta*, Gude.

Differs from the type and the other varieties in being smaller. It resembles the variety *obesa* in the deeper umbilicus, in the sloping underside, in the comparative height of the shell, and in the median parietal fold not reaching the apertural ridge, but the last whorl widens more, as in the type. In colour it is pale yellowish-white, flammulated with chestnut above and at the side. The peristome is livid brown, the left margin paler, the right margin a little depressed.—Major diameter, 17 mm.; minor diameter, 14 mm.; altitude, 7 mm.

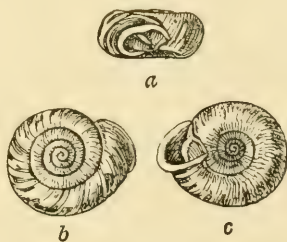


Fig. 15.—*Plectopylis achatina* var. *venusta*, Gude.

Hab.—Burma. Type in my collection.

Is smaller than any form of *P. achatina* I have seen. It is pale yellowish-white in colour, flammulated with chestnut above and at the sides. It resembles the variety *obesa* in the deeper umbilicus, the

sloping underside and in the comparative height of the shell; the median parietal fold does not quite reach the apertural ridge as in that variety, and the lower horizontal parietal fold is not visible from the aperture; it resembles the type in the sudden widening of the last whorl. The peristome is livid brown, the right margin being a little depressed; the left margin is paler. The specimen figured was received by me as *Plectophylis pachystoma*, Theobald; but as I am not aware that this name was ever published, and as I have seen other shells so labelled, I consider it expedient to discard the name altogether. A specimen in the collection of Dr. von Möllendorff, likewise labelled *P. pachystoma*, I am unable to separate from the present variety, although it shows no flammulation and the peristome is white; in other respects it is identical.—(Ibid., p. 134.)

NOTES.

Mollusca of Grange-over-Sands, Lancashire.

In the "*Journal of Conchology*" for October last, Mr. R. Standen, records a number of land mollusca from the district of Grange-over-Sands, Lancashire, a very interesting list—in spite of certain errors in nomenclature. To this list I can make the following additions, which were obtained when I was in England during the early part of 1897, viz. *Arion empiricorum*, Fér., var. *johnstoni*, Kal.; *A. subfuscus*, Drap., var. *griseus*, Cligc.; and *Agriolimax agrestis*, L.—H. V. FOWLER, M.A.

Note on some Slugs from Teneriffe.

We have recently received from Mr. W. Moss, two slugs collected by Lieut. Col. G. S. Parry, at Teneriffe, these and some sent by the latter conchologist in 1895, enable us to add three well known species, not hitherto recorded we believe, to the Canary Isles.

Lieut. Col. Parry sent one of us six young specimens of *Limax maximus*, L., three of which were collected at Orotava, Teneriffe, and three at Galdar, Grand Canary; also four specimens of *Agriolimax agrestis*, L., from Santa Cruz.

The two specimens sent by Mr. Moss, are *Limax marginatus*, Müll., and *Agr. agrestis*, L., both from Orotava, Teneriffe.

After carefully examining d'Orbigny's figure and description of *L. canariensis*, we have no doubt in our own minds that it was a specimen of *Agr. agrestis*, L. Wollaston in 1878 was inclined to regard it as such, although subsequent writers have referred it to *L. variegatus*, Drp.—WALTER E. COLLINGE and F. J. PARTRIDGE.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

5TH MEETING, NOVEMBER 11TH, 1898.

The President in the chair.

The following were elected honorary members of the Society :—

Professor W. C. M'Intosh, M.D., LL.D., F.R.S., Edgar A. Smith, F.Z.S.,
and Professor Dr. Heinrich Simroth.

EXHIBITS.

By Mr. Collinge : A specimen of *Limax maximus*, L., with a strongly marked white keel.

By Mr. H. H. Bloomer : A series of Indian shells chiefly of the following genera, *Vivipara*, *Bythinia*, and *Bulinus*.

By Mr. F. J. Partridge : A series of collections made in October in the district between Birdlip and Nailsworth, Gloucestershire, records of all of which were placed upon the Society's lists.

By Mr. Guy Breeden : Abnormal specimens of *Limnaea auricularia* from Harborne, Worcestershire.

6TH (ANNUAL) MEETING, DECEMBER 9TH. 1898.

The President in the Chair.

The Annual Report of the Council and the Treasurer's Statement were presented and adopted.

The Secretary reported that as no amendments had been received to the Council's nominations, the following would constitute the Council and Officers for 1899.

President—Walter E. Collinge, F.Z.S.

Treasurer—Guy Breeden.

Secretary—H. Howard Bloomer.

Other Members of Council—Messrs. H. Willoughby Ellis, F. J. Partridge,
Bromley Peebles, and G. Sherriff Tye.

The President then delivered his Address, the subject being "The Morphology of the Pulmonata."

ANNUAL REPORT, 1898.

In presenting their First Annual Report your Council have to congratulate the Society upon the steady progress it has made since its foundation in July last.

Since the Inaugural Meeting six new ordinary members and three honorary members have been elected.

The financial condition of the Society is satisfactory. After payment of all liabilities there remains a balance of 19s. 9d. in hand, which includes 5s. for a subscription paid in advance.

During the year five meetings have been held, at which six papers have been read, and numerous specimens exhibited.

Your President has agreed to publish, free of all cost to the Society, its "Proceedings" in the "*Journal of Malacology*," and your Council have made very advantageous terms whereby the Journal will be supplied to all members. One part has already been issued and distributed to the members.

In order to illustrate papers read before the Society, a "Publication Fund" has been opened, and a number of contributions promised; further donations are earnestly desired.

The nucleus of a Library has been received and it is hoped to add to this in the coming year.

Your thanks are due to the President and Council of Mason University College and Prof. T. W. Bridge, for the facilities they have so kindly given in permitting our meetings to be held in the Zoological Department of the College.

7TH MEETING, FEBRUARY 10TH, 1899.

The President in the Chair.

The following nominations for membership were read:—

Messrs. F. W. Carpenter, and William Moss, F.C.A.

PAPER READ.

"Note on some Slugs from Teneriffe," by Walter E. Collinge, F.Z.S., and F. J. Partridge.

EXHIBITS.

By Mr. Guy Breeden: Shells of the British species of *Hyalinia*.

By Mr. F. J. Partridge: Two sinistrose monstrosities of *Buccinum undatum*, also a specimen showing strong carination of the whorls, and a collection of *Clausilia* comprising all the British species and many varieties.

By the President: Specimens of *Omolonys felina*, Guppy, in alcohol. The radula of various species of *Limax*, *Arion*, *Amalia*, *Testacella*, *Vitrina*, *Hyalinia*, *Zonites*, *Helix*, *Clausilia*, *Limnaea*, *Vivipara*, *Physa*, *Ampullaria*, *Chiton*, *Conus*, *Purpura*, etc. A series of preparations of the integument of various Pulmonates.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology; ser. i, vol. xvii, (pts. 65A, 68), pp. xxxii + 225-348, pls. xxxviii-xlviii: ser. ii, vol. xi, (pt. 44), pp. 209-339, pls. xlii-li. Philadelphia: Academy of Natural Sciences.

In the Marine, or first, series of this work Mr. Pilsbry, with the assistance of Dr. Sharp, issues the concluding portion of the bibliographical catalogue of fossil Scaphopoda, and he also gives an outline account of the Aplacophora, following mainly the system of Simroth in Bronn's "*Klassen und Ordnungen des Thierreichs*." We may note *Tesserae*, a new section of *Dentalium* for the group of *D. apicale*; *D. bednalli*, n. sp., from S. Australia; and revisions of nomenclature on pp. 253, 255. The bibliographical list will also prove of great service.

In that little known group, the Aplacophora, Mr. Pilsbry proposes *Simrothiella*—a well-deserved compliment—as a subgenus of *Proncomenia*, and he also suggests *Ichthyomenia* as a new name for *Ismenia*, Pruvot non King.

In chronicling the completion of this series, we welcome the announcement that it is proposed to undertake a monograph of the "Marine Bivalves," and trust it will prove as successful as the recent volumes of the first series have been.

In the second series Mr. Pilsbry continues that exceedingly difficult genus *Drymaeus*, and completes his review of the South American species. We may chronicle as new species *D. subsimilaris*, loc. incert., *D. blandi*, Columbia, and *D. fresnoensis*, Columbia; also interesting rectifications of nomenclature on pp. 219, 291, 297, and 301.—E. R. S.

Crick, G. C.—List of the Types and Figured Specimens of Fossil Cephalopoda in the British Museum (Natural History). 8vo, pp. 103. London: 1898.

The desirability and utility of lists which record the original names and references of type specimens cannot be overestimated. The one before us contains a record of all the types and figured specimens of both British and foreign Fossil Cephalopoda, which are preserved in the British Museum.

The names follow in alphabetical order, each specimen being entered under the name first given to it, with a reference to the work in which the same was either described or figured, then follow the formation and locality with the registered number in the collection, together with short notes correcting localities or relating to the condition of the specimen.

All praise is due to Mr. Crick for the very careful manner in which he has carried out this useful piece of work, invaluable alike to the specialist and malacologist in general.—W. E. C.

Crick, G. C.—On the muscular attachment of the Animal to its shell in some fossil Cephalopoda (Ammonoidea). Trans. Linn. Soc. Lond (2nd ser. Zool.), 1898, vol. vii, pp. 71-113, pls. 17-20.

Le mode d'attachement du corps à la paroi de la grande chambre qui termine la coquille est connu chez un certain nombre de Céphalopodes de la famille des Nautiloïdes; mais il ne l'est que chez très peu d'Ammonoïdes. L'auteur s'attache à montrer que l'animal de l'Ammonoïde était fixé à la portion dorsale de la coquille, probablement de la même façon que le Nautilé actuel, c'est à dire au dessus du bord de la dernière cloison, par deux muscles coquilliers plus ou moins écartés l'un de l'autre et par un muscle annulaire. Dans ce premier mémoire Mr. Crick décrit la forme et la position de ces impressions dans les divers types d'Ammonoïdes.

Dans le Nautilé actuel les deux traces musculaires sont réunies dorsalement et ventralement par une étroite bandelette, l'anneau (annulus). Les fibres musculaires sont insérées, non pas directement sur la substance calcaire de la coquille, mais sur une mince couche de conchyoline. Ordinairement il ne reste à l'intérieur de la coquille, pour indiquer ces insertions, qu'une ligne étroite généralement en relief, qui correspond à la limite antérieure de ces impressions musculaire et annulaire. La limite postérieure, au contraire, se voit très rarement. Sur un moulage interne cette ligne apparaît comme un sillon linéaire; c'est à cet état que l'on peut l'observer sur les moulages naturels de la chambre antérieure des fossiles. L'auteur a mis ces lignes en évidence dans le *Nautilus pompilius* en remplissant la chambre antérieure de paraffine, et en dissolvant ensuite le calcaire par l'acide chlorhydrique.

L'auteur décrit d'abord les deux types fossiles chez lesquels il a trouvé ces indications le plus clairement marquées. C'est d'abord chez un *Cryoceras quadratum*, n. sp., provenant du Speeton clay of Yorkshire qu'il a vu les impressions musculaires les plus nettes; elles se touchent presque; elles sont très peu au dessus du dernier septum; leur surface est grenue, leur limite antérieure est nette tandis que la postérieure est beaucoup plus floue. Il n'y a pas trace d'anneau. Dans le petit espace triangulaire séparant les deux impressions il y a deux petites taches doubles, longitudinales, probablement en relation avec les attaches musculaires de l'animal.

Les traces de l'anneau ont été relevées sur divers échantillons mais surtout sur un *Cardioceras excavatum*, J. Sowerby, de l'Oxford Clay, conservé au British Museum. On y voit distinctement deux lignes flexueuses, à peu près parallèles, écartées l'une de l'autre de 1.5 mm. qui vont du bord ombilical au bord périphérique et qui suivent vaguement les sinuosités des lobes du dernier septum.

Ces premières indications étant posées, l'auteur recherche dans une importante série d'Ammonoïdes les traces qui peuvent correspondre à celles qu'il a relevées dans les deux types précédents. Il en a trouvé chez un grand nombre d'entre eux coïncidant avec l'anneau et les muscles coquilliers. Il est impossible, dans ce court résumé, de donner la liste des espèces, genres et familles, où ces vestiges ont été

relevés. On les trouvera parfaitement exposés et accompagnés de très beaux dessins, probants et démonstratifs, dans les quatre planches de cet important mémoire.

Un certain nombre de caractères anatomiques ont conduit divers auteurs à ranger les Ammonoides parmi les Céphalopodes Dibranches ; mais les constatations de Mr. Crick montrent clairement que l'animal des Ammonoides possédait une musculature de fixation tout à fait analogue à celle du Nautilé, seul représentant actuel des Tétrabranches. On trouve en effet, dans les deux cas, un anneau en plus des muscles coquillers ; cet anneau devait servir au manteau de surface de fixation sur la coquille.—L. JOUBIN.

Martens, E. von. und Wiegmann, Fr.—Land-und Süsswasser-Mollusken der Seychellen. Mitteil. Zool. Samml. Berlin, 1898, Bd. 1, pp. 1-94, Tf. 1-iv.

Dr. E. von Martens here describes and figures the following new species and varieties:—*Ennea erinaceus*, and var. *uniseriata*, *Streptaxis constans*, and var. *silhouette*, *S. violaceus*, *S. perelegans*, *S. braueri*, *Helix pratunida*, Morel., vars. *mahesiana* and *silhouette*, *Buliminus ornatus*, Dufo, var. *biornatus*, *B. aldabra*, and *Hapalus braueri*. A new genus (*Priodiscus*) is constituted for the *Trochomorpha serrata*, Nev.

In the second part (pp. 37-94) by Herr Wiegmann, a beautifully illustrated account is given of the anatomy of most of the above new forms, and also the following:—*Ennea dussumieri*, Fér., *Streptaxis souleyetianus*, Petit, *Streptostele nerilli*, H. Ad., and its var. *dubia*, Wgm., *Priodiscus serratus*, H. Ad., *Kaliella subturritula*, Nev., *Helix similaris*, Fér., *H. unidentata*, Chemn., and *H. studeriana*, Fér., *Buliminus ornatus*, Dufo, var. *fulvicans*, Pfr., *Achatina panthera*, Fér., *Subulina octona*, Chemn., and *Succinea mascarena*, Nev.

In addition to plates 3 and 4 illustrating the anatomy, there are some 40 figures in the text.—W. E. C.

Wiegmann, F.—Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo. Landmollusken (Stylommatophoren). Abhandl. d. Senckenb. naturf. Gesell., 1898, Bd. xxiv, pp. 289-557, Tf. xxi-xxxi.

In the space at our disposal it is quite impossible to do more than enumerate the species which the author has anatomically described in this beautiful and valuable memoir. To those malacologists who regard the slug-fauna of Borneo, Java, etc., as worked out, we would commend a perusal of Herr Wiegmann's description of the anatomy of two new species of *Parmarion*, illustrated by 37 figures.

A word must be said in praise of the number and execution of the illustrations, accompanying the 268 pages of letterpress, there are 11 folio plates of 378 figures, all of which are excellent.

The species described are as follows:—*Rhysota brookei*, Ad. and Reeve ; *Parmarion maculosus*, n. sp. ; *P. (?) dubius*, n. sp. ; *Helicarion kiikenthali*, Kob. ; *H. halmahericus*, Kob. ; *H. minahassae*, Kob. ; *Medyla viridis*, Q. and G. ; *Everettia jucunda*, Pfr. ; *E. müllendorffi*, Kob. ; *E. (?) fulvocarnea*, Mrts. ; *Dendrotrachus conicoides*, Metc. ; *Hemiplecta densa*, Ad. and R. ; *Xesta cincta*, Lea. ; *X. halmaherica*, Strub. ; *Dyakia hugonis*, Pfr. ; *Trochomorpha lardea*, Mrts. ; *T. bicolor*, Mrts. ; *T. planorbis*, Less. ; *T. timorensis*, Mrts. ; *Planispira exceptiuncula*, Fér. ; *P. expansa*, Pfr. ; *P. schcepmaekeri*, Pfr. v. *halmaherica*, Kob. ; *P. surrecta*, Bttgr. and Strub. ; *P. zonalis*, Fér. ; *P. toxotropis*, Pfr. ; *Pseudobba quoyi*, Desh. ; *Phenia kiikenthali*, Kob. ; *Albersia pubiceps*, Mrts. ; *Papuna vitrea*, Fér. ; *Amphidromus porcellanus*, Mouss. ; *A. sinistrals*, Reeve.—W. E. C.

Viguier, C.—Contributions à l'étude du développement de la *Tethys fimbriata*. Arch. de Zool. exp. et gen., 1898, (S. 3) vol. vi, pp. 37-62, pls. vii-ix.

Dr. Camille Viguier in the 5th of his series of "*Recherches sur les Animaux inférieurs de la Baie d'Alger*" gives an interesting account of the development of the large Opisthobranch *Tethys fimbriata*. He compares and contrasts the early

stages with the account given by Heymons (*Zeitschr. f. wiss. Zool.* 1893) of the development of the allied mollusc *Umbrella mediterranea*, and also with Conklin's account of *Crepidula*, from which it appears that on the whole *Tethys* has a much more regular segmentation.

There have been difficulties in the research. The animals are apparently not easy to obtain, and the spawn is difficult to keep alive and normal. This last spring (1898) none was obtainable.

For the rest—the segmentation is unequal, and of the spiral type known in various molluscs; but for the exact “cell-lineage” of the micromeres and macromeres we must refer to the full description and the figures. The three plates in execution and clearness of shading certainly leave much to be desired, but we gather from a “Note” at the end of the paper that this has not been altogether the author's fault.

Of the later embryonic and larval stages the account is brief. Dr. Viguier has evidently, on account of the difficulty of rearing, not had quite enough material in these older periods at his disposal. We concur entirely in his remarks as to the great interest and importance attaching to careful studies of the later transformation of the larval Opisthobranchs.—W. A. HERDMAN.

Sturany, R.—Catalog der bisher bekannt gewordenen Südafrikanischen Land-und Süßwasser-Mollusken. Denk. K. Akad. Wiss. Wien, 1898, Bd. lxxvii, pp. 537-642, 3 pls. [Jan. 1899.]

Melville, J. Cosmo, and Ponsonby, J. H.—A Contribution towards a Checklist of the Non-marine Molluscan Fauna of South Africa. Proc. Malac. Soc. Lond., 1898 (Decr.), vol. iii, pp. 166-184.

The faunal regions dealt with in these two papers vary somewhat, for while Dr. Sturany includes the country up to the Zambesi, Messrs. Melville and Ponsonby draw the line at the Tropic of Capricorn. Unfortunately the former author appears—though he gives a lithographed supplement dated November—to have been unaware of the latter authors' paper (*Ann. Mag. N.H.*, August 1898, (7) vol. ii, pp. 125-30, pl. vii), as also Sowerby's “*Appendix to the Marine Mollusca*.”

The most striking feature is the great abundance of the genus *Ennea*. No less than 73 are quoted by Dr. Sturany and 75 by Messrs. Melville and Ponsonby. One species (*E. obovata*) quoted by these latter authors appears to be omitted from Dr. Sturany's list: it would also be of interest to know his authority for quoting *E. zanguebarica* as S. African. Morelet, when describing it, appears not to have properly stated its locality, but the very name is a note of warning. Dr. Sturany criticises, and with some show of reason, the figures given by the English authors, but when he complains (p. 542) that the basal tooth in *E. perspicua* is not shown in the original drawings, he seems a little hypercritical, as it is described as “*interna*.”

The classification of the Helicoid and Zonitoid land shells appears to vary greatly in the two lists: perhaps it will be long before this is properly cleared up, as the anatomy is unknown in most cases. While Dr. Sturany gives 118 species, Messrs. Melville and Ponsonby give 105 for their more restricted region.

It may be pointed out that *Pella*, used by Dr. Sturany, is preoccupied in Coleoptera: many other points of difference as to the value of certain names arise, too elaborate in their nature to be dealt with here, but it may be remarked that *Helix fanulus* (Sturany, p. 588) is the young of a species of *Ennea*.

The slugs do not appear to be very numerous, less than a dozen species in all; while Dr. Sturany quotes *Agriolimax lævis*, the English authors quote *A. agrestis*, and appear to have overlooked *Urocyclus kirkii* and *Oncidium peronii*.

The *Achatinidae* are, as would be expected, fairly numerous; we note that in the English authors paper *A. schencki* does not appear. *Buliminus* is well represented as are the *Pupidae*. *Buliminus vitellinus* appears to have escaped the notice

of Messrs. Melvill and Ponsonby; while on the other hand *B. picturatus* was described, not from Natal as Dr. Sturany quotes, but from "Mogadoxo, Zanzibar." Further this author complains that the original describer does not state whether *Pupa layardi* is dextral or not, but this may be gathered from the description, which refers to the right, as opposed to the columellar, lip.

The *Succineidæ* are moderately represented as are the *Limnæidæ*. The *Auriculidæ* are few; we do not notice in Dr. Sturany's paper *Auricula pusilla*, *Melampus granifera*, or *Alexia myosotis*.

In the land operculata the lists differ widely. My attention has been called to the exceeding similarity of *Cyclopus natalensis*, Pfr., and *Cycloph. klobukowskii*, Morlet; comparing the two I am entirely unable to find any distinction and, as Pfeiffer's locality has never been confirmed, I regard it as erroneous. Dr. Sturany omits *Pomatias* (= *Cyclostoma*, auct.) *hartvigianum*, *lineatum*, and *sarcedes*, while he gives *parvispirum* and *goudotianum*, not mentioned in the other list. Of these last two species the former may come really from Zanzibar, as Morlet was erroneous in several references in the paper quoted, and the latter is also uncertain in S. Africa and may belong to Madagascar.

There are also a few species of such genera as *Cleopatra*, *Hydrocena*, etc.; and about 14 species of Pelecypoda.

We give below a summary of Dr. Sturany's list to show the distribution in the various families.

<i>Testacellidæ</i> . . . 2	<i>Buliminidæ</i> . . . 24	<i>Melaniidæ</i> . . . 4
<i>Streptaxidæ</i> . . . 73	<i>Pupidæ</i> . . . 34	<i>Hydrobiidæ</i> . . . 6
<i>Rhytididæ</i> . . . 16	<i>Succineidæ</i> . . . 9	<i>Paludinidæ</i> . . . 2
<i>Vitrinidæ</i> . . . 13	<i>Vaginulidæ</i> . . . 4	<i>Ampullariidæ</i> . . . 5
<i>Limacidæ</i> . . . 1	<i>Onchidiidæ</i> . . . 1	<i>Assimineidæ</i> . . . 4
<i>Urocyclidæ</i> . . . 5	<i>Limnæidæ</i> . . . 24	<i>Hydrocenidæ</i> . . . 1
<i>Zonitidæ</i> . . . 11	<i>Auriculidæ</i> . . . 9	<i>Neritidæ</i> . . . 3
<i>Helicidæ</i> . . . 78	<i>Truncatellidæ</i> . . . 2	<i>Cyrenidæ</i> . . . 7
<i>Achatinidæ</i> . . . 49	<i>Cyclophoridæ</i> . . . 14	<i>Unionidæ</i> . . . 7
Total 408 species.		

Messrs. Melvill and Ponsonby's list includes between 360 and 370 species.

A study of the two lists leads to the idea that while one author has specially devoted himself to bibliographical research, the others have dealt mainly with named specimens. The two lists will stimulate research in South Africa, where, doubtless, many species still await the collector.—E. R. Sykes.

Sarasin, P. and F.—Die Süßwasser-Mollusken von Celebes. Demy 4to, Bd. 1, pp. viii + 104, Tf. i-xiii. Wiesbaden: 1898, C. W. Kreidel.

In this beautiful volume the brothers Sarasin describe a large series of freshwater molluscs from the Celebes, most of which are new. The work is prefaced by a short account of the operculum and radula of the *Melaniidæ* of the Celebes, the remaining pages being occupied by the descriptions of the undermentioned new genera and species:—*Melania toradjarum*, *paliolarum*, *patriarchalis*, and var. *torutensis*, *gemmifera*, *monacha*, *scalariopsis*, *molesta*, *carota*, *testudinaria*, v. d. Busch., var. *perconica*, *zeamais*, *insule sacrae*, *tomoriensis*, *kuli*, *centaurus*, *asperata*, Lam., var. *celebicola*. *Tylomelania*, nov. gen. *T. neritiformis*, *carbo*, *porcellanica* and var. *connectens*. *Vivipara crassibucca*, *persculpta*, *lutulenta*, *rudiipellis*. A new genus of *Limnæidæ*—*Miratesta*—is described with a short account of the anatomy: containing *M. celebensis*, and the vars. *robusta*, *ampullacea* and *gracilis*. *Isidora callosa*. An interesting new genus—*Protancylus*—is described with two species *adhaerens* and *pileatus*, anatomical details are given of the latter. Of the Lamellibranchiata, *Corbicula mantannensis* and *possoënsis*.

The work is illustrated by 6 not particularly clear Meisenbach plates, and 7 lithographic plates by Werner and Winter which leave nothing to be desired. The

work is beautifully printed and reflects the greatest credit on all concerned in its production.—W. E. C.

Posselt, H. J.—Conspectus Faunæ Groenlandicæ. Brachiopoda et Mollusca. 8vo, pp. xix + 298, T. i-ii and map. Kjøbenhavn: 1898.

This beautifully illustrated work may be regarded as a contribution from the Malacological Department of the Zoological Museum of the University of Copenhagen, under the able directorship of Dr. Jenson. It describes no less than 249 species and varieties of molluscs, excluding a dozen or more doubtful ones. The distribution has been worked out in great detail. The original descriptions are in many cases reproduced, and much information respecting points of nomenclature and classification is given.

The following species and varieties are new :—

Pecten imbrifer, Lov., var. n. *lamellosa*, *Nucula groenlandica*, n. sp., *Bela woodiana*, Möll., var. n. *tumida*, *B. decussata*, Couth, var. n. *inflata*, *Sipho* (*Siphonorbis*) *lindahli*, n. sp., *S. (Tritonofusus?) costiferus*, n. sp., *Buccinum undulatum*, Möll., var. n. *percrassa*, *B. groenlandicum*, Chem., var. n. *major*, *B. perdix*, (Beck) Mörch, vars. n. *lutea*, *persulcata*, *wandelii* and *carinata*, *B. hydrophanum*, Hancock, vars. n. *tumidosa*, *percrassa* and *texturata*.—W. E. C.

Bergh, R.—Die Opisthobranchier der Sammlung Plate. Zool. Jahrb. (Suppl. iv.) 1898, pp. 481-582, T. 28-33.

Professor Bergh here describes and figures a series of Opisthobranchs collected by Dr. Plate on the west coast of South America. Most of the species are new, some forming the types of new genera, whilst a few species originally described by d'Orbigny in 1847 are dealt with. Of the Tectibranchia there are 2 new species, *Aplysiopsis juanina*, n. gen., n. sp., a form allied to *Aplysia*, and *Pleurobranchus platei*. Amongst the Nudibranchia the following are new: *Archidoris rubescens*, *A? incerta*, *Anisodoris*, a new genus which is distinguished from the true *Archidoris* by the presence of a large prostate, as in *Homoiodoris*, but distinguished from the latter by the absence of an armour to the otherwise very strong vagina. It includes the *Doris punctuolata*, d'Orb., and *D. variolata*, d'Orb., in addition to *A. marmorata* and *A. tessellata*, which are new. *Platydoris punctatella* is an interesting new species, while *Tyrinna nobilis* forms the type of a new genus distinguished by its peculiar tentacles, which are furnished on the inner side with a series of folds, the penis is unarmed. The remaining new species are *Chromodoris juvenca*, *Euplocamus maculatus*, *Candiella australis*, *Cratena cavanca* and *pusilla*, *Phidiana exigua*.

A supplement describes 2 species of *Marsena* (*perspicua*, L., and *pacifica* Bgh.), of the former the following varieties are new, *incerta*, *maculosa*, and *marginata*.

W. E. C.

Howe, J. L.—Variation in the shell of *Helix nemoralis* in the Lexington, Va., Colony. Amer. Nat., 1898, vol. xxxii, pp. 913-23, 2 figs.

This is an interesting paper, bristling with statistics, on what appears to be the only successful colony of *H. nemoralis* in the United States. It seems strange that this attractive species should not have been more widely transplanted either accidentally or by design. Attempts to colonise it from the Lexington source in other parts of the United States have apparently proved a failure, with the possible exception of Blairstown, Pa.

Mr. Howe finds, as the result of very careful study, that the tendency to variation in this colony proceeds along definite lines, and is not the same in all localities of the colony, which now extends over an area of about $1\frac{1}{4}$ miles by half a mile. He also finds that a considerable destruction of individuals does not materially modify this tendency. The lines of variation are much the same as with us, with one exception, viz., that there is a great development of supplemental bands, either by split-

ting off from the normal five, or by the appearance of bands altogether additional to these. About 4 per cent. of the shells collected show this tendency. In the ground colours and their relative frequency there appears to be little departure from European types. It is difficult to judge of the value of the percentage tables in which Mr. Howe elaborates the frequency of a number of the band-formulæ, without knowing whether the series of shells, on which they are based, were the result of collecting *every nemoralis* procurable at the time, or only of a judicious selection. The former is quite possibly the case, as we read of considerably more than 2000 specimens being taken in two consecutive summers from an area 200 feet square, and that a garden !—B. TOMLIN.

Babor, J. F.—Note on *Ariunculus austriacus*, n. sp., from the Alps in Austria. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 156-8, fig. 1.

Dr. Babor describes as a new species a specimen of *Ariunculus* from Schneeberg near Vienna (Coll. of Dr. A. Wagner). It approaches most closely the Sardinian species *A. isselii*, Bgt.—W. E. C.

Newbigin, Marion J.—Colour in Nature, a study in Biology. 8vo, pp. 344, London: 1898, John Murray.

The parts relating to the coloration of the Mollusca occupy pp. 184-95 and pp. 203-4. So much has been written in recent years respecting colour variation, chæmalonic colour changes, and changes which take place in a life time, in the Mollusca, which find no mention here, that the malacologist will be greatly disappointed with this chapter. On p. 203 it is stated "In the Mollusca colour-patterns are, except in the cuttles, confined to the shells," the writer is evidently unaware of the colour-patterns exhibited by *Limax maximus*, *Tebennophorus striatus* and many other molluscs. Next to the Insecta few animals show so favourably, protective colouring, rapid colour changes, etc., as the mollusca, and some reference to these would have proved interesting.

In other parts of the work there is much that is new and interesting.—W. E. C.

Crick, G. C.—Descriptions of new or imperfectly known species of *Nautilus* from the Inferior Oolite. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 117-39, figs. 1-15.

The admirable work that Mr. Crick has of recent years been carrying out in the collections of Fossil Cephalopoda in the British Museum, merits the best thanks and appreciation of all malacologists. The present paper describes and figures a series of new or imperfectly known species of *Nautilus*, and is in every way a piece of useful and careful work. The new species are: *N. bradfordensis*, *fuscus*, *crassinuatus*, *impedens*, *enterobratus*, *rotundus*, *subrotundus*, *semiornatus*, and *exiguus*, all in the collection of the British Museum.—W. E. C.

Webb, W. M.—On the Anatomy and Synonymy of the Genus *Mariella*, Gray. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 147-55, pl. ix.

Two species are described and figured viz. *M. dussumieri*, Gray, and *M. boddomei*, G.-A. Mr. Webb accepts the views of previous writers respecting *Tennentia thwaitesii*, Humb., and *Vega nordenskiöldi*, Westr., regarding them as synonymous with the former species.—W. E. C.

Möllendorff, O. v.—*Mariella*, Gray. Nachr. Deutsch. Malak. Gesell., 1899, pp. 20-22.

Philippinella, gen. nov. is proposed for *Tennentia quadrasi*, Mildff., and *T. carinata*; also *T. philippinensis*, Semper.

Simroth, H.—Über die Gattung *Parmacella*. L'Ann. du Mus. Zool. l'Acad. d. l'Acad. Imp. Sc. St. Petersb., 1898, pp. 1-12.

Smith, Edgar A.—On the Land-Shells of Curaçoa and the neighbouring islands. Proc. Malac. Soc. Lond., 1898, pp. 113-16, figs. 1-11.

Pilsbry, H. A.—Remarks on the American species of *Conulus*. Naut., 1899, pp. 113-17.

Sterki, V.—Some studies on the Morphology of the *Cycladidae*. Ibid., pp. 117-19.

Vayssièrè, A.—Monographie de la famille des Pleurobranchidés. Ann. d. Sci. Nat., 1898, T. viii. (8th ser.) pp. 209-402, pls. 13-28.

Prof. Vayssièrè has here given a most valuable account of the *Pleurobranchidae*. After a short history of the work of previous writers, an admirable account of the general anatomy is given, followed by the systematic portion, where the individual anatomical characters of most of the species are set forth in detail. The following genera are recognised: *Berthella*, Blainv., with 7 species, one of which is new (*B. brocki*). Cuvier's genus *Pleurobranchus* is divided into three sub-genera, viz.: *Bourvieri*, Vays., with 6 species, *Pleurobranchus* (*sens. prop.*), Cuv., with 35 species, and *Susania*, Gray, with 6 species; and *Oscanius*, Leach, with 1 species.

The anatomical characters of the above sub-genera seem sufficiently well marked and important to rank as genera.—W. E. C.

Johnstone, J.—The Spawning of the Mussel (*Mytilus edulis*). Rpt. for 1898, Lancashire Sea-Fisheries Lab. Liverpool: 1899, pp. 36-53, pls. i-ii.

From an extensive series of observations made during 1898, the author has been able to arrive at some definite conclusions respecting the date of spawning of this species. Briefly summarised the results arrived at are as follows: the maximum spawning period occurs about June or July, during which there is a rapid and complete extrusion of the genital products, accompanied by a series of histological changes in the visceral mass and mantle; then follows a short period of rest during part of August and September. The reformation of the germinal epithelium next commences to take place, followed by a slow proliferation of ova and spermatozoa, which occupies the rest of the year. The genital products are formed less rapidly in the spring, during which period a slow emission of these takes place, continuing on until the maximum spawning period occurs.

The different histological changes in the gonads at the various stages are described and figured.—W. E. C.

Herdman, W. A.—Oysters and Disease. Ibid., pp. 62-67.

Kohn, C. A.—Note on Occurrence of Iron and Copper in Oysters. Ibid., pp. 67-79.

Ashcroft, R. L.—Mussel-beds and Mud-banks. Ibid., pp. 79-81.

Amaudrut, Alex.—La Partie Antérieure du Tube digestif et la torsion chez les Mollusques Gastéropodes. Ann. d. Sci. Nat., 1898, T. vii (8th ser.) pp. 1-291, pls. i-x.

Pilsbry, H. A.—New American Land Shells. Naut., 1899, vol. xii, pp. 101-104.

Pilsbry, H. A.—*Potamolithus jacuhyensis*, n. sp. Ibid., p. 113.

Sterki, V.—New *Pupidae*. Ibid., pp. 127-29.

Dall, Wm. H.—On a new species of *Drillia* from California. Ibid., p. 127.

Cockerell, T. D. A.—Another new snail from New Mexico. Ibid., p. 131.

Crosse, H.—Études Malacologiques sur des Genres nouveaux ou peu connus. Journ. de Conchyl., 1898, vol. xlv, pp. 205-8, pl. x, figs. 1-2.

Hervier, R. P. J.—Descriptions d'espèces de mollusques, provenant de l'Archipel de la Nouvelle-Calédonie. Ibid., pp. 209-13, pl. x, figs. 3-4.

- Fischer, H.**—Description d'une nouvelle de *Plectopylis*. Ibid., pp. 214-18, figs. 1-6.
- Dautzenberg, Ph. et Fischer, H.**—Note sur le *Pleurotomaria beyrichi*. Ibid., pp. 218-24, pl. xi.
- Mayer-Eymar, C.**—Description de Coquilles fossiles der terrains tertiaires inférieurs. Ibid., pp. 225-37, pls. xii-xiv.
- Wohlberedt, O.**—Molluskenfauna des Königreichs Sachsen. Nachr. Deutsch. Malak. Gesell., 1899, pp. 1-20.
- Möllendorff, O. von.**—Die Phenacohelicien. Ibid., pp. 22-25.
- Kobelt, W.**—Die Fauna der Cocosinsel. Ibid., pp. 26-28.
- Naeglele, G.**—Eine neue *Pomatia* aus Persien. Ibid., pp. 28-29.
Helix (Pomatia) salomonica, Naeg.
- Koch, V. von.**—Ein neuer Fundort von *Helix caperata*, Mtg. Ibid., p. 29.
- Crick, G. C.**—On a Deformed Example of *Hoplites tuberculatus*, J. Sowerby, sp., from the Gault of Folkestone. Geol. Mag., 1898, vol. v, pp. 541-2, figs. a. b. c.
- Herdman, W. A.**—The Twelfth Annual Report of the Liverpool Marine Biology Committee, etc. Liverpool: 1898, pp. 1-56, figs. 1-5.
- Standen, R.**—Notes on the Land Mollusca of Grange-over-Sands, Lancashire. Journ. Conch., 1898, vol. ix, pp. 113-14.
- Pallary, P.**—Deuxième contribution à l'étude de la Faune malacologique du Nord-Ouest de l'Afrique. Journ. de Conchyl., 1898, vol. xlvii, pp. 49-170, pl. v-ix.

Reviews of a number of important papers received, are for want of space, compelled to stand over until the next issue.

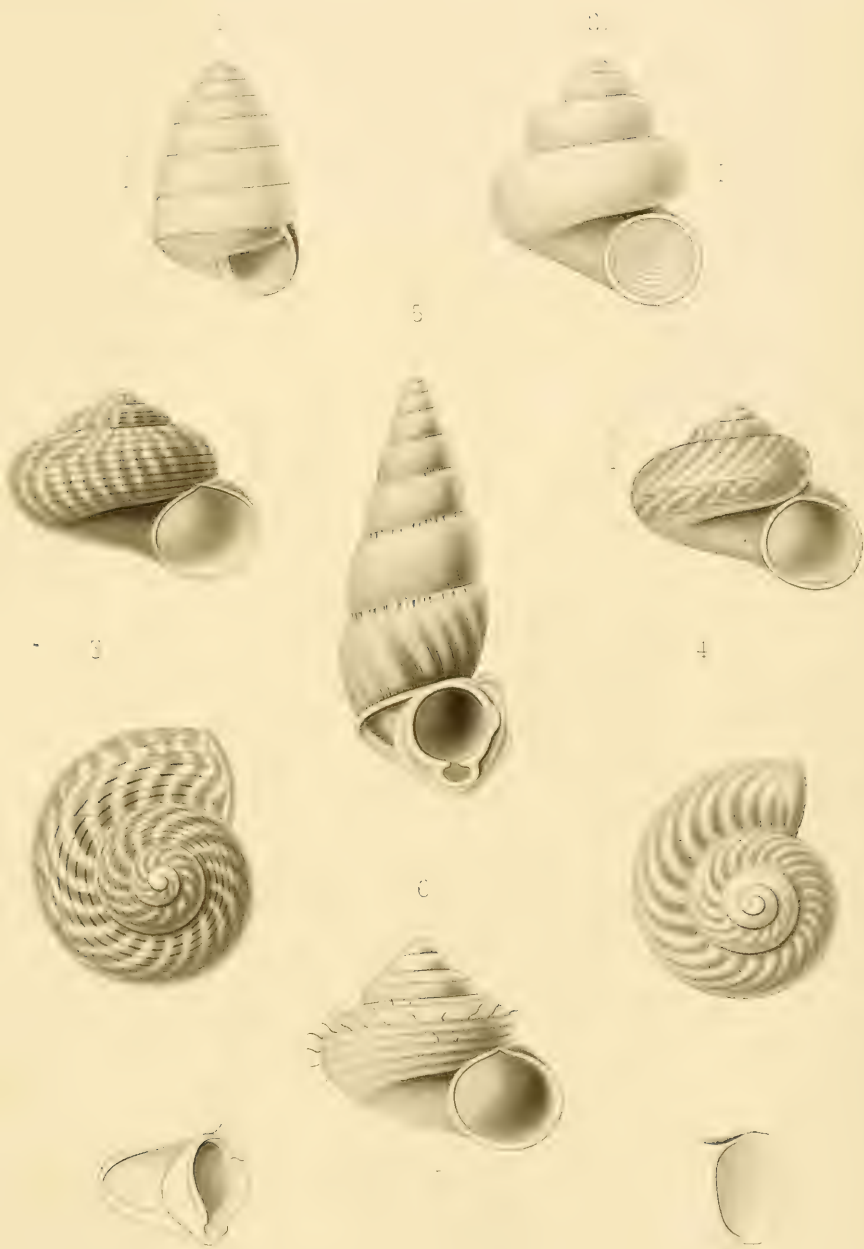
EDITOR'S NOTES.

Professor Wm. Healey Dall of the Smithsonian Institute, has recently been elected an Honorary Member of the Conchological Society of Gt. Britain and Ireland.

The recently issued volume for 1898 of the Palaeontographical Society, contains amongst other memoirs:—The Carboniferous Lamellibranchiata, pt. 3. by Dr. Wheelton Hind; the Inferior Oolite Ammonites, pt. 10, by Mr. S. S. Buckman; and the Carboniferous Cephalopoda of Ireland, pt. 2, by Dr. A. H. Foord.

In the "Naturalists' Journal"—an interesting and practical monthly—beginners will find many useful papers and notes dealing with British Land and Freshwater molluscs.

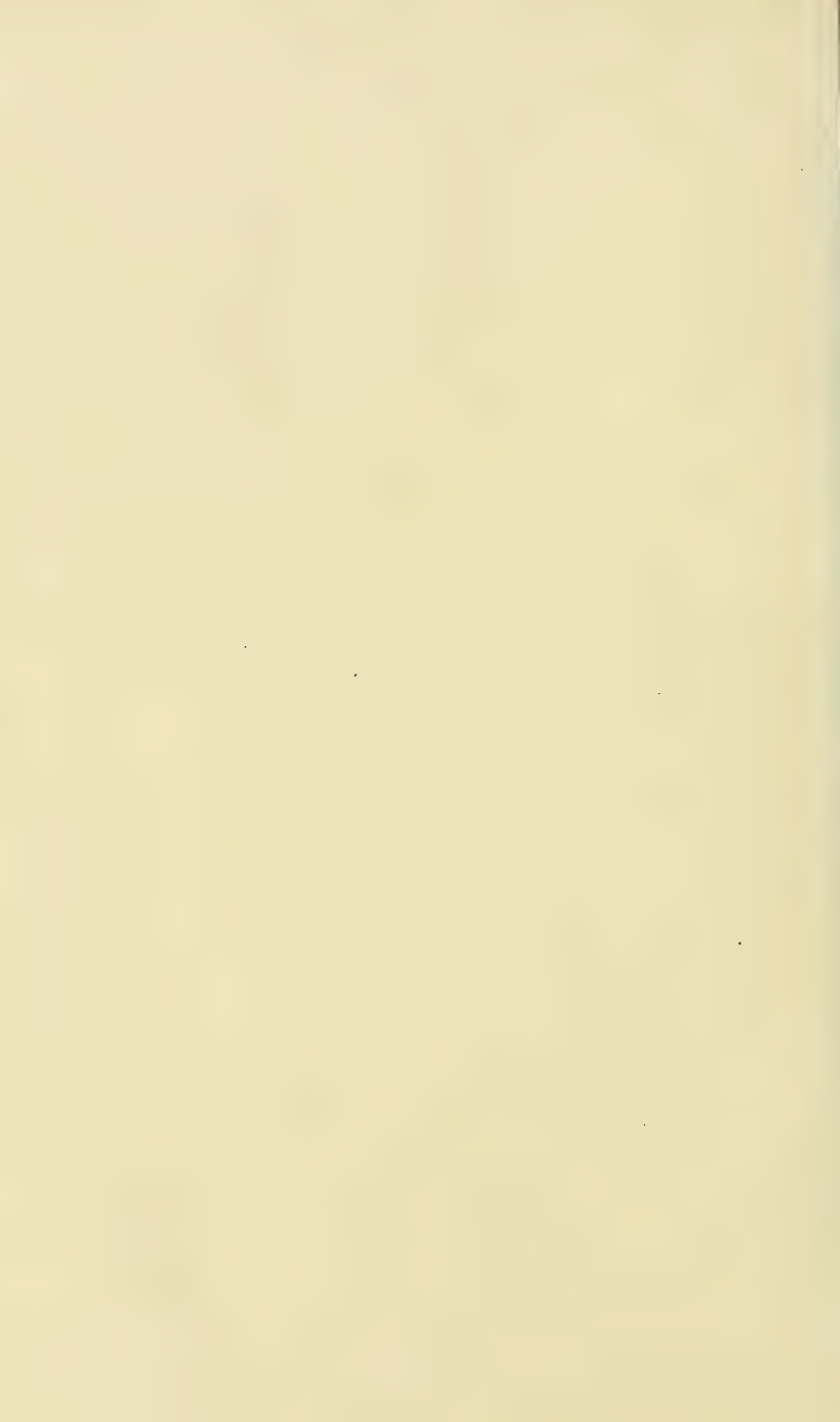
We regret to have to record the deaths of A. H. Everett, in June last; Giovanni Michellotti, on December 21st, 1898, aged 84; and E. W. Roper, on December 31st, 1898, aged 39.



J.Green del.

Lith Werner & Winter, Frankfurt a/M

NEW LAND SHELLS FROM CEYLON.



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VOL. VII.

MALACOLOGICAL COMMUNICATIONS FROM NEW ZEALAND.

By HENRY SUTER,

Christchurch, N.Z.

1.—On the Carnivorous Genera *Paryphanta* and *Rhytida*.

(Plate iii, figs. 1, 1a.)

IN Fischer's "*Manuel de Conchyliologie*" it is stated, that *Rhytida* is ovoviviparous, the assertion being no doubt based on the observations made by E. Marie and H. Crosse on *Rhytida inaequalis* from New Caledonia. This at once led me to place the New Zealand *R. meesoni* in the genus *Paryphanta*, having ascertained that it also laid calcareous eggs. The shell however is quite characteristic of *Rhytida*, being malleated, containing more carbonate of lime, and being therefore in the living animal not so pliable as the shells of *Paryphanta*, and the periostracum not overlapping the inner layer of the shell at the peristome. Besides this species, the type of the genus, *R. green-woodi*, is now also known to lay calcareous eggs,¹ and it is to be surmised that all our species of *Rhytida* are ovoviviparous, which is also the case with *Paryphanta bushyi*, *hochstetteri*, *urnula*, *edwardi* and *Schizoglossa novoseelandica*, the latter being evidently a *Paryphanta* in which the shell has become rudimentary.

The composition of the shell of Paryphanta is almost unique, inasmuch as the periostracal layer, consisting chiefly of conchin, is predominant, and very little calcareous matter is deposited on its inner

¹ F. Hutchinson, Jun., Trans. New Zeal. Inst., xxx, p. 535.

side. In *P. urnula* only about the first two whorls are calcareous, the remainder consisting simply of conchin. I found this out in the following way. Having received a specimen of that mollusc preserved, unfortunately, in strong alcohol, I was unable to remove the hardened animal without destroying the shell, and the idea struck me (also unfortunate!) of removing the animal by immersing the whole specimen in a solution of caustic potash. The result was a dark brown solution; the first two calcareous whorls intact, the radula, and a fine, brown membrane from the periostracum swimming in the liquid!

The situation of the eyes in Paryphanta and Rhytida differs somewhat from that in the *Helicidae*. In the latter the eyes are not quite at the top of the ommatophores, but on their upper side; in our two genera of carnivorous snails however they are still much more removed backward, as fig. 1a shows. This is most likely due to a great development of the olfactory bulb, as these molluscs have to hunt for their food under moss, in loose mould, etc., where eyes cannot be of much use. I give here a figure of *R. greenwoodi* (Pl. iii, fig. 1) drawn from life, which shows the presence of small buccal papillae.

The food of Paryphanta and Rhytida consists no doubt chiefly of earthworms, at least in captivity they readily feed on them. They extend the odontophore, hook the worm with the long sharp teeth on the former, and by withdrawing the tongue the worm passes slowly down into the stomach. During that operation all the tentacles are retracted, no trace of them can be seen. Occasionally they also feed on other molluscs, and it is significant that in the same situations where *Paryphanta* shelters during the winter months *Athoracophorus* is also found. To a specimen of *R. greenwoodi* I gave two living *Flammulina thaisa*: the following day I found the latter shells quite empty, not a trace of the animals left, one specimen with one large, the other with two smaller holes rasped out at the base, through which the tongue of *Rhytida* could be passed to extract those parts of the animal lying behind the columellar muscle. They do not touch introduced slugs, such as *Limax agrestis*, the sticky slime is probably not to their liking.

It is not difficult to keep *Paryphanta* and *Rhytida* in captivity for a considerable time if they are provided with sufficient moisture, a good quantity of fresh moss and earthworms for food, but I have never observed them copulate or even lay eggs.

The radula.—It is not always easy to say whether any given species has a rhachidian tooth on its radula or not. This tooth is certainly the first worn or broken off, and I have seen many odontophores on which for the whole length only a few central teeth could be made

out. Thus Mr. Moss has found a central tooth on the radula of *R. greenwoodi*, and there is no doubt about it, as he kindly sent me a photo showing that tooth distinctly. But neither Capt. Hutton nor myself have come across a radula of that species with a rhachidian tooth. *Rhytida* has a smaller number of teeth in a transverse row, and they only vary from 9 to 18 on each side from the mesial; the central tooth is usually wanting. It may be of some interest to give here the formulæ of the species that have been examined:—

Rhytida greenwoodi, Gray. 9—0—9 to 11—0—11 (Hutt.).

„ „ 11—1—11 (Moss.).

„ *patula*, Hutt. 18—0—18 (Hutt.).

„ *citrina*, Hutt. 17—0—17 (Hutt.).

„ *australis*, Hutt. 16—0—16 (Hutt.).

„ *meesoni*, Sut. 12—0—12 (Sut.).

Species of *Paryphanta* have as a rule a much larger number of teeth on a transverse row, which of course corresponds in some measure with the much larger size of the animal and the radula, and the number of teeth on each side from the middle varies from 14 to 67. A rhachidian tooth is nearly always present. Here follow the formulæ of some of the species:—

Paryphanta bushyi, Gray. 50—0—50 (Hutt.).

„ *hochstetteri*, Pfr. 67—1—67 (Godwin-Austen.).

„ *urnula*, Pfr. 14—1—14 (Sut.).

„ *edwardi*, Sut. 26—1—27 (Sut.).

„ *atramentaria*, Shuttl. 50—1—50 (Sut.). (1 from Victoria).

I also examined the radula of *P. bushyi*, and saw no trace of a central tooth. When describing the dentition of *P. urnula* I stated that there was no rhachidian tooth, but I examined the odontophore again and found a central tooth in several places, though the greater part is without it.

Again *Schizoglossa novoseelandica*, Pfr., has according to Hedley no central tooth, the formula being 24—0—24, but in a photo taken by Mr. Moss there is a central tooth distinctly visible.

2.—Abnormities in the Teeth of the Radula of Land Shells.

(Plate iii, figs. 2, 3.)

The first time I came across a very remarkable abnormality in the teeth of the radula was in 1891, in *Endodonta varicosa*, Pfr., which was figured in "*Trans. N. Zeal. Inst.*," xxiv, pl. xxii, fig. 29. Since then two more cases came under my notice, one in *Phacussa hypopolia*, Pfr. (fig. 2), where the central tooth is unicuspid instead of tricuspid,

and the laterals, normally also tricuspid, offer various distorted shapes, but the transition teeth, 9—12, are nearer the normal form.

The other case occurred in *Charopa bianca*, Hutt. (fig. 3), where the laterals 1—4 have about the same shape as the transition tooth 5 in the normal radula.

The same form of abnormal teeth is repeated through the whole length of the radula.

The normal radula of *P. hypopolia* is figured in "*Trans. N. Zeal. Inst.*," xxiv, pl. xx, fig. 4, and "*Man. Conch.*" (2), ix, pl. ii, fig. 1, and that of *Ch. bianca* in "*Trans. N. Zeal. Inst.*," xxiv, pl. xxi, fig. 21.

3.—Endodonta (*Charopa*) *egesta* (Gray).

(Plate iii, figs. 4—6.)

The peculiar sculpture of this species, resembling slightly that of *E. (Acanthoptyx) acanthinula*, Crosse, from N. Caledonia, and also *Flammulina (Sutera) ide*, Gray, from New Zealand, made me somewhat suspicious whether this shell was really correctly classed, its anatomy being hitherto unknown. When in Auckland I found a few living specimens, and these I used for studying part of their anatomy.

The jaw (fig. 4) is thin and transparent, yellowish, arcuate, tapering at both ends, with a sharp concave cutting edge without median projection, vertically distantly and faintly striated.

The radula (fig. 5) is tongue-shaped, with the formula 9—5—1—5—9. Marginals low and wide, with longer entocone and mesocone, which are united at their base; the ectocone appears first as a small cusp, then multiplies to 2 and 3 cusps, which are reduced to a single cusp again. The transition teeth become more elevated, the long mesocone separates from the equally long entocone, the ectocone still remaining small. The laterals are tricuspid, the mesodont extends beyond the posterior end of the base, and the endodont has a longer and stouter cusp than the ectodont. The tricuspid central tooth has a short mesodont, which does not extend to the posterior end of the base, and minute side-cusps.

Reproductive organs (fig. 6). The albumen gland is small, the free oviduct slightly contracted behind its middle, and the receptaculum seminis is inserted very little in front of the place where the vas deferens diverges from the common ducts. The penis sac is stout and rather short, the vas deferens enters in front of the posterior end, where the retractor muscle is attached, and the penis sac is contracted.

Foot without a caudal pore.

There can be no doubt now that the species is in its right place.

4.—*Endodonta* (*Ptychodon*) *ureweraensis*, n. sp.

(Plate iii, figs. 7—10.)

Shell minute, depressed globose, perforated, irregularly and zigzag banded with rufous on a yellowish-white ground, closely-ribbed, about 15 riblets per mill.; spire low conical. Whorls $5\frac{1}{2}$, flatly rounded, periphery regularly convex; the volutions first slowly, then a little more rapidly increasing, protoconch smooth, consisting of $1\frac{1}{2}$ whorls, suture impressed. Aperture subvertical, lunate, peristome straight, acute, margins distant. Mouth with 11 lamellae, two on the penultimate whorl, a high, rather stout and long lamella below the middle, and a second threadlike lamella half way between the first and the upper margin, far back in the aperture in adult specimens, but easily visible in young shells, not shown in the figures; a third lamella on the very slowly descending columellar lip, forming a long, sharply pointed tooth; on the parietal wall there are eight long, narrow, subequidistant threadlike folds. Base convex, perforation minute, open, no reflection of the columellar lip.

Diam. maj. 2·8, min. 2·6; height 1·5 mm.

Hab.—Ngaputahi, Urewera Country, New Zealand, where it was found by Mr. A. Hamilton of Dunedin, to whom I am indebted for so many new forms of New Zealand mollusca. *Type* in my collection.

This species may at once be distinguished from all the other species of *Ptychodon* by the character and situation of the lamellae; it is the eighth species of that subgenus.

5.—*Lagochilus lignarius* (Pfr.).

It is about one year since I was favoured with the rare opportunity of examining the living animal of the above species, when I was able to state that there is a very *distinct notch* visible on the upper surface of the tail, just behind the operculum. This being characteristic of the genus it confirms Dr. von Möllendorff's opinion on the generic position of this and allied species. Well preserved specimens of the shell show longitudinal, membranaceous plaits, which however are very easily rubbed off.

6.—On Clessin's New Species of *Scalaria* from New Zealand.

Having ascertained from the "*Zoological Record*" for 1897 that Clessin had described several new species of *Scalaria* from New Zealand, I requested Mr. E. R. Sykes to send me copies of the diagnoses and tracings of the figures, and I am very grateful to him for having so kindly attended to my wishes, and I am now in a position to give my opinion on Clessin's new species.

1.—*Scalaria novoseelandiae*, Clessin.

In Martini and Chemnitz, *Scalariidae*, p. 57, pl. xv, fig. 4, 1897. Had Clessin taken the trouble to look up the species already described from New Zealand he could have ascertained that this species was known a long time ago, for it is in reality nothing else but *Scalaria tenella*, Hutton, P. L. S. N. S. Wales, (1) vol. ix, p. 943, 1885 = *lineata*, Hutton, Cat. Mar. Moll. N. Zeal., p. 22, 1873, *non* Kiener; = *lyra*, Hutton, Man. N. Zeal. Moll., p. 70 (1880), *non* Sowerby.

2.—*Scalaria reevei*, Clessin.

In Martini and Chemnitz, *Scalariidae*, p. 63, pl. xv, fig. 9, 1897.

From the description, and partly from the figure (the spiral ridge round the umbilical region being omitted) it is evident that this species is *Scalaria* (*Opalia*) *zelebori*, Frauenfeld, Reise der Novara, Zool., vol. ii, pt. 3, p. 7, pl. i, fig. 6, 1868 = *intermedia*, Hutton, Cat. Mar. Moll. N. Zeal., p. 10, 1873.

Clessin seems not to be aware of the fact that Frauenfeld has described and figured this species, as he enumerates it (l. c. p. 50) thus: "*S. zelebori*, Frauenfeldt, in coll.!" Well preserved specimens show the costae of the lower whorls all winged a little below the suture, as is indicated in the figure given by Clessin. This species is also found in the Pliocene of New Zealand. Frauenfeld and Clessin mention 10 whorls, a specimen in my collection has 12, and its height is 24 mm.

The first of the above species is found in the Hauraki Gulf, the second also, and at Tauranga and Stewart Island besides.

It is very much to be regretted that such careless work in founding new species should be done, especially in a monograph of Martini and Chemnitz.

At the present day the following five species of *Scalaria* are known to occur in New Zealand waters:

1.—*Scalaria* (*s. str.*) *tenella*, Hutton, 1885. (*lineata*, Hutt., *non* Kiener; *lyra*, Hutt., *non* Sow.; *novoseelandiae*, Cless.)

2.—*Scalaria* (*Clathrus*) *philippinarum*, Sowerby, 1844.

3.—*Scalaria* (*Clathrus*) *jukeriana*, Forbes, 1852. (*wellingtonensis*, T. W. Kirk, 1882.)

4.—*Scalaria* (*Opalia*) *australis*, Lamarck, 1840.

5.—*Scalaria* (*Opalia*) *zelebori*, Frauenfeld, 1868. (*intermedia*, Hutt.; *reevei*, Cless.)

S. australis is a recent addition to the New Zealand fauna; specimens were collected and brought to Capt. Hutton from the Kermadec Islands by Miss Robinson of Christchurch.

7.—*Purpura scobina*, Q. & G., var. *rutila*, n. v.

Differs from the typical form, in which the interior is brown or blackish-brown, by having this part of the shell coloured orange or brownish-orange, the columella fulvous, and the epidermis of the shell light-brown or cinereous, with a hue of yellow. This colour-variety was first discovered by Mr. C. Spencer near Auckland, and later on I found it in one place only at Te Onepoto, South Island. The Auckland specimens are much larger, height up to 33 mill., and of a brighter colour, whilst the smaller South Island shells have a maximum height of 17 mill. The outer lip has always an inner white margin. *Type* in my collection.

Capt. Hutton mentions a similarly yellow variety of *P. haustum* from Dunedin, which however I have not seen.

8.—On some New Zealand Species of *Trophon*.

(Plate iii, figs. 11—14.)

Our species of *Trophon* may conveniently be brought into three groups:

- A.—Group of *T. stangeri*, Gray, with *T. ambiguus*, Phil.
- B.— „ *T. patens*, H. and J., with *cheesemani*, Hutt.
- C.— „ *T. duodecimius*, Gray (genus *Kalydon*, Hutt., including *T. paivae*, Crosse, *T. plebejus*, Hutt., and *T. inferus*, Hutt.).

The species of each of these groups are closely allied to one another, and the question arises whether some of them should not take the rank of a variety only. This, however, I do not attempt just now, as the soft parts have to be examined and compared, and it is better left to a future revision of our *Muricidae*.

The dentition of *T. stangeri* has been described by Capt. Hutton² but the radula of *Trophon ambiguus* (Phil.), has remained unknown. Fig. 11 represents the teeth of the radula of the latter species, very much resembling those figured by Capt. Hutton. The central tooth transverse with 5 cusps of which the median and the externals are much larger, but all five are united at the base. The laterals angled and unicuspid.

Fig. 12 illustrates the Muricoid operculum with subapical nucleus.

Trophon ambiguus (Phil.) var. *pumila*, n. v.

This variety is best described as a very elegant dwarf. It is smaller and more slender, the anterior canal a little shorter, but otherwise it

² Trans. N. Zeal. Inst., xx, p. 121, pl. xiii, fig. Q (*T. quoyi*, Reeve).

shows all the characters of the typical form. My largest specimen has 8 whorls, the height is 25, and the diam. 12 mill., but the specimens usually obtained have only 6 whorls and a height of 14 mill.

The teeth of the radula are shown in fig. 13. The central tooth has cusps of the same number and size as the species, but they are not united at the base. This however *may* be due to the young age of the specimen.

Hab.—Dredged with oysters in Foveaux Strait. *Type* in my collection.

The usual dimensions of *T. ambiguus* for adult specimens are 40 × 20 mm., but sometimes real giants are met with; in Lyttelton Harbour I dredged in two fathoms a specimen measuring 55 × 34 mm., which is the largest I have seen.

Trophon patens (H. & J.).

This species was provisionally removed from *Purpura* to *Trophon* by Mr. E. A. Smith³ on account of the Muricoid operculum. Having found a living specimen I thought it to be of some interest to examine the dentition, which is represented in fig. 14. The central tooth has 5 cusps, the mesial one is long and stout, the two distal cusps are about half as large, and between the distal and mesial cup is a minute denticle on each side; the cusps are not united at the base.

Thus the dentition also bears out the correctness of Mr. E. A. Smith's classification of this species. The shell is generally smooth, but extreme forms occur which have the same narrow grooves as *T. cheesemani*, Hutt.

EXPLANATION OF PLATE III.

- Fig. 1. Rhytida greenwoodi*, Gray, drawn from life, nat. size.
 „ 1a. „ „ „ ommatophore, enlarged.
 „ 2. *Phaeussa hypopolia*, Pfr., abnormal teeth of radula, much magnified.
 „ 3. *Charopa bianca*, Hutt., „ „ „ „ „
 „ 4. *Charopa egesta*, Gray, jaw, much magnified.
 „ 5. „ „ „ teeth of radula, greatly magnified.
 „ 6. „ „ „ reproductive organs, much magnified.
 „ 7—9. *Ptychodon ureweraensis*, Sut., shell. × 10.
 „ 10. „ „ „ aperture with lamellae, magnified.
 „ 11. *Trophon ambiguus*, Phil., teeth of radula, much magnified.
 „ 12. „ „ „ operculum, magnified.
 „ 13. „ „ „ *var. pumila*, Sut., teeth of radula, much magnified.
 „ 14. „ *patens*, H. & J., teeth of radula, much magnified.

ON SOME LAND SHELLS FROM SOMALILAND.

By EDGAR A. SMITH, F.Z.S.,

British Museum (Natural History), London.

A few shells collected in Somaliland by Dr. Donaldson Smith have recently been presented to the British Museum by His Highness the Gwaekwar of Baroda. They include two new forms and an interesting series of *Buliminus revoili* and *Otopoma poirieri*.

1.—*Buliminus revoili* (Bourguignat).

Limicolaria revoili, Bourguignat in Revoil's Faune et Flore des pays Comalis, p. 42, pl. ii, figs. 24—26.

Buliminus (Rachis) moreletianus, Ancey : Naturalist. Sicil., 1882, vol. i, p. 206.

Hab.—Lugat, 4300 feet.

This species is very closely related to the Arabian *B. albatrus*, Fér., indeed it is chiefly distinguished by a difference in the colour-markings, being longitudinally striped with light and dark brown, whereas *albatrus* usually exhibits two transverse interrupted brown bands round the middle of the body-whorl. Three specimens of the latter species in the Museum, however, lack these bands, having instead the lower part of the body-whorl faintly streaked with brown longitudinally, otherwise being pure white throughout. M. Bourguignat describes this species as "*valide costata*," whilst M. Ancey characterises the whorls as "*subobliquis confertisque striis sculptis*." The latter description is certainly the more applicable to the majority of specimens, indeed I have only seen two collected by Messrs. T. L. and W. D. James in the interior of the country and by them presented to the Museum, which might be said to be *costate*.

These two examples are also almost exactly similar in shape to *B. albatrus*, the whorls being, however, perhaps in the slightest degree more convex.

M. Ancey appears to have rejected the specific name suggested by Bourguignat merely because the latter placed it in *Limicolaria*, a generic position which, as pointed out by Ancey, is evidently incorrect.

2.—*Otopoma (Georgia) poirieri*, Bourguignat.

Otopoma poirieri, Bourguignat : Moll. Afrique, 1881, p. 6.

Georgia poirieri, id. in Revoil's Faune et Flore des Pays Comalis, p. 74, pl. iii, figs. 54—56.

Hab.—Ogardain, Central Somaliland (F. L. and W. D. James and E. Lort Phillips in Brit. Mus.); Morobyeh, Megag, Shake Abacodley, and Lugat (D. Smith).

The colour of this species, described by Bourguignat as "*candido-sublutescens*," is variable. Some specimens are pure white, but the majority are transversely lineated with brown upon the upper surface, two of the lines at the periphery being of a darker tint and thicker than the rest. The apical whorls are often yellowish or livid, having a dark line just above the suture. One specimen has the upper surface of an almost uniform brownish colour, becoming gradually paler beneath. A little variation in form is noticeable, some examples having the spire more elevated than others and the body-whorl higher or more ventricose. The umbilicus in adult shells is nearly always concealed by a callus, but in one specimen which has the appearance of maturity, it is only partly covered. There is not much variation in the sculpture, but considerable difference in size is observable, the largest specimen being 25 millim. in its greatest diameter, whilst the smallest example, evidently adult, is only 16.

With regard to the specific distinctness of this so-called species, I must confess that it is scarcely separable from *O. guillaini*, Petit, also a Somali form. The latter is somewhat larger and has a more elevated spire, but otherwise is very similar. The supposed *specific differences* in M. Bourguignat's *Georgia naticopsis*, *G. perrieri*, and *G. revoili* are far beyond the ken of such an ordinary person as the writer, and, I may add, beneath the notice of such experts as Kobelt and Moellendorff who entirely disregard these names in their "*Catalog der gegenwärtig lebend bekannten Pneumonopomen*."

3.—*Ennea somaliensis*, n. sp.

Testa cylindræa, alba, anguste rimata, oblique tenuissime confertim lirata, liris supra ad suturam denticulatis; spira cylindrica, superne obtusa, vix conoidea; anfractus 8, lente accrescentes, duo supremi pellucidi, læves, duo sequentes convexiusculi, cæteri minus convexi, sutura vix obliqua sejuncti, ultimus penultimo angustior, pone labrum bi-scrobiculatus vel indentatus; apertura sex-dentata; peristoma album, expansum, reflexum, marginibus callo tenui junctis; dens unicus parietalis lamelliformis, concavus, ad insertionem labri situs, dentes duo inæquales in margine dextro, unicus basalis, alius minimus ad basin columellæ, sextus columellaris validus. Longit. $8\frac{1}{2}$ millim., diam. $3\frac{3}{4}$. Apertura cum perist. 3 longa, $2\frac{1}{2}$ lata.



Hab.—Ganlibah Goles Range, 5900 feet.

A very delicately costulate species, the upper ends of the fine closely packed costulæ forming a very pretty minutely denticulate suture. In one specimen, rather more slender than the type, the second tooth within the outer lip is almost obsolete.

4.—*Buliminus (Petræus) somaliensis*, n. sp.

Testa ovata, supra acuminata, umbilicata, tenuis, subpellucida, fusco-cornea, sericata, costellis tenuibus obliquis arcuatis confertis sculpta; spira convexe conica, ad apicem haud acuta; anfractus 7 convexiusculi, supremus lævis, cæteri mediocriter convexi, regulariter crescentes, ultimus elongatus, antice oblique lente descendens; apertura inverse auriformis, longit. totius $\frac{1}{2}$ fere æquans; peristoma tenue, marginibus vix conniventibus, callo tenuissimo junctis, dextro vix incrassato, anguste expanso, columellari late reflexo, intus subplicato. Longit. 18 millim., diam. $9\frac{1}{2}$. Apertura 8 longa, 5 lata.

Hab.—Ganlibah Goles Range, 5900 feet.

Remarkable for its thin texture and the delicate unthickened lip. The costulæ are very fine, and gradually become more numerous as the shell increases. The obsolete fold on the columella is only seen when the aperture is viewed in a particular position with the outer lip towards the eye.

NOTES ON THE NOMENCLATURE OF THE BRITISH NUDIBRANCHIATA, WITH A DETAILED CLASSIFICATION OF THE GROUP.

BY THE REV. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

THE descriptive catalogue of the British Nudibranchiata given by Jeffreys, *British Conch.*, vol. v, pp. 28—94, was prepared for him by Alder (ibid. p. 27), Jeffreys himself not having made a special study of the group. I have recently had occasion to examine the references for the authorship of the names of the various species, as given in those pages. It appeared possible that the results might be of more than private interest, since it is exactly 30 years since that volume appeared, and the researches of Herdman, Garstang, and many others have done much to call attention to a branch of our Mollusca which has been strangely neglected, and which is of surpassing interest, from more than one point of view, to the practical zoologist. They have therefore been put into a tabular form, following the pages in "*British Conchology*," vol. v, with which they should be read.

I have ventured to append a revised classification of the whole group, based upon Bergh.² Dr. Norman, in his "*Revision of British Mollusca*,"³ which unfortunately still remains incomplete, has drawn up a classification of our Nudibranchiata, on somewhat, but by no means entirely similar lines to this.

- P. 33. ALDERIA MODESTA, Lovén.—The reference to an article by Allman is beside the point. Read *Stiliger modestus*, Lovén, Oefv. K. Vetensk. Akad. Förh., i (1844), p. 49. *Alderia* sp. Allman, Rep. Brit. Ass., 1844, p. 65. Not *Stiliger modestus*, Ehrenberg.
- P. 35. FIONA NOBILIS, A. and H.—Substitute *Fiona marina*, Forsk. — *Limax marinus*, Forskäl, Descr. Anim. (1775), p. 99; Icon. Rev. Nat. (1776), pl. 26, f. G.
- P. 36. EMBLETONIA MINUTA, Forbes and Goodsir.—The reference to Rep. Brit. Assoc., 1839, is altogether inadequate. That Report (Trans. of Sections, p. 80) contains no description whatever, only short mention of species. The species in question was described by Forbes and Goodsir in "*Athenæum*," 1839, p. 647, not however as "*Eolidia minuta*," but as "*Eolida minima*." The paper is entitled "*Notes on zoological researches in Orkney and Shetland during the month of June, 1839, by Ed. Forbes and John Goodsir*." The mistake, started by Forbes and Hanley and continued by Alder and Hancock in their monograph, has been current ever since.
- P. 37. EOLIS PAPILLOSA, Linné.—This is one of the few British Mollusca which were described by Linné in the 12th, but not in the 10th, edition of the "*Systema*." He described it also in the 2nd edition of the "*Fauna Suecica*," the date of which is intermediate between the two above-mentioned editions of the "*Systema*." The reference therefore should read: Fauna Suec. (1761), p. 508, no. 2093.
- P. 39. EOLIS CORONATA, Forbes.—For "Forbes" read "Forbes and Goodsir." The article in the "*Athenæum*" is that in which *Embletonia minima* (referred to above) was described, and it is a curious accident which has attached the name of both authors to one of the species therein described, and the name of one of them only to another.
- P. 40. EOLIS ELEGANS, A. and H.—For "p. 315" read "p. 316."
- P. 41. EOLIS LINEATA, Lovén.—For "*E. lineata*, Lov., Ind.

² Semper, Reisen im Archipel. der Philippinen, vols. 1, 2 and Suppl.

³ Ann. Mag. Nat. Hist., 1890, 6 ser. vi, pp. 70—91.

- Moll. Scand., p. 8," read "*Aeolis lineata*, Lovén, Oefv. K. Vetensk. Akad. Förh., iii (1846), p. 140."
- P. 43. EOLIS LANDSBURGI, A. and H.—The original spelling *Landsbergii* (a latinising of Mr. Landsborough's name) must be kept, since it is not incorrect in form.
- P. 44. EOLIS CARNEA, A. and H.—For "Brit. Nud. Moll. App. (24), p. ix," read "Brit. Nud. Moll., p. 50 (1855)."
- P. 45. EOLIS PEACHII, A. and H.—For "p. 19" read "p. 191."
- P. 46. EOLIS ANGULATA, A. and H.—Probably *E. paradoxa*, Quatref. takes precedence. The reference is Quatrefages, Ann. Sci. Nat., 2 s. xix (1843), p. 274, pl. xi.
- P. 48. EOLIS AURANTIACA, A. and H.—Read *aurantia*, under which name the species was described in the reference given, but altered, without any reason being given, to *aurantiaca* in the monograph. There is nothing to choose, linguistically, between the two forms, both being equally bad Latin.
- P. 49. EOLIS PUSTULATA, A. and H.—For "pl. 46" read "pl. 45."
- P. 50. EOLIS AMOENA, A. and H.—For "pl. 20" read "pl. 30."
- P. 51. EOLIS ARENICOLA, Forbes. — For "Forbes" read "A. and H.," who in the monograph adopted Forbes' MS. name, as is correctly stated in the next line.
- P. 51. EOLIS GLOTTENSIS, A. and H.—Read *glottensis*. The species was originally described as *Glottensis*, and altered, without explanation, to *Glottensis* in the monograph. *Glota* or *Glotta* (for both spellings are current) is the Roman name for the Clyde, and is often spelt *Clota* as well.
- P. 52. EOLIS VIRIDIS, Forbes.—For "pl. 2, f. 12" read "pl. 2, f. 18."
- P. 52.—EOLIS PURPURASCENS, Fleming.—If this very doubtful species is to be kept in our lists at all, it would be well to add the reference to Fleming's British Animals, ii (1828), p. 285, no. 150. In the reference given it was figured without description.
- P. 54. EOLIS TRICOLOR, Forbes.—After "p. 5" add "pl. 1, f. 1."
- P. 56. EOLIS EXIGUA, A. and H.—For "p. 292" read "p. 192."
- P. 57. PROCTONOTUS MUCRONIFERUS, A. and H.—For "xviii, p. 161" read "xiii, p. 161, pl. 2."
- P. 58. ANTIOPA CRISTATA, Delle Chiaje.—For "Descr. Stor. An. Nap., pl. 88" read "Descriz. Notom. Invert. Sicil. Cit. (1841), pl. 88, f. 1—12."
- P. 62. DENDRONOTUS ARBORESCENS, Müller. — Substitute for

- arborescens* (as pointed out by Dr. Norman) *frondosus*, Ascanius. The reference is: *Amphitrite frondosa*, Ascanius, Kon. Norsk. Vid. Selsk. Skr., v (1774), p. 155, pl. 5, f. 2.
- P. 63. HERO FORMOSA, Lovén.—After “1844” insert “p. 49” and dele the remainder.
- P. 64. LOMANOTUS MARMORATUS, A. and H.—The reference has been omitted. It is: *Eumenis marmorata*, A. and H., Ann. Mag. Nat. Hist., xvi (1845), p. 311.
- P. 66. SCYLLAEA PELAGICA, Linné.—The reference to the 10th ed. of 1756 (p. 656) takes the place of that to the 12th (1766—68).
- P. 67. TRITONIA HOMBERGII, Cuvier.—For “Mém. du Mus., i, p. 483, pl. 31, f. 1, 2” read “Ann. Mus. Hist. Nat. Paris, i (1802), p. 483, pl. 31, 32.”
- P. 69. AEGIRUS, Lovén.—Read “*Aegires*,” see Lovén, Oefv. K. Vetensk. Akad. Förh., i, 1844, p. 49.
- P. 70. AEGIRUS PUNCTILUCENS, d’Orb.—The reference to d’Orbigny, to be correct, should read “Mag. de Zool., vii (1837), Classe v, p. 7 of memoir.”
- P. 71. TRIOPA CLAVIGER, Müller.—No reference to any description by Müller is given, while that to an article by Johnston is unnecessary. O. F. Müller described the species in Zool. Dan. Prodr. (1776), p. 229, pl. 17, f. 1—3. Johnston’s original description of *Tergipes pulcher* (the identity of which with Müller’s species he afterwards recognised) was in Mag. Nat. Hist., vii (1834), p. 490, f. 59.
- P. 73. THECACERA VIRESCENS, A. and H.—The original description was not, as here given, in the monograph, but in Ann. Mag. Nat. Hist., 2 s. viii (1851), p. 290. The reference to A. and H.’s appendix should be “p. iv” not “p. iii.”
- P. 76. POLYCERA LESSONI, d’Orb.—For “p. 5” read “Classe v, p. 5, of memoir,” and for “Lessoni” read “Lessonii.”
- P. 80. IDALIA PULCHELLA, A. and H.—For “p. 19” read “p. 46.”
- P. 83. DORIS TUBERCULATA, Cuvier.—The reference is incorrect. Read Ann. Mus. Hist. Nat. Paris. iv (1804), p. 469, pl. 74 (*Doris* pl. 2), f. 4.
- P. 85. DORIS TESTUDINARIA, Risso.—For “p. 33, f. 15” read “p. 33, pl. 2, f. 15.” Bergh, perhaps rashly, identifies this species with *Argo*, Linné.
- P. 86. DORIS COCCINEA (Forbes), A. and H.—By “Rep. Ægean Invert. B. A., 1843,” is meant Rep. Brit. Ass., 1843, p. 133

where, however, no description is given, but only the name. Alder and Hancock described the species in Brit. Nud. Moll., p. 42; Fam. 1, pl. 7.

- P. 86. *DORIS REPANDA*, A. and H.—This species is, I believe, to be identified with *Doris obvelata*, O. F. Müller, as has already been held by Lovén and others. As, however, this view does not yet appear to have received acceptance in this country, the question may be examined in detail. Müller gave the usual brief description in his Prodrömus, p. 229, no. 2769 (1776), and followed this up by a more detailed account in the Zoologia Danica, ii, p. 8, tab. xlvii, f. 1, 2 (1788). The important parts of this account are subjoined, together with Alder and Hancock's description of their *repanda*; the figures of both authors should also be compared with the descriptions throughout.

Body above an inch long [L. 1 inch. Brit. Conch., v. p. 87], of a pure, waxy, transparent white.

Cloak widely expanded, covered with small, distant, obtuse and rather inconspicuous opaque white tubercles An irregular row of opaque white or sulphur yellow angular spots runs down each side at a short distance from the margin of the cloak, which is thin and broad, extending much beyond the foot, and marked on the under side with slender white nerve-like lines towards the margin.

Branchiæ small in proportion to the size of the animal, consisting of five imperfectly tripinnate transparent white plumes; the three anterior ones elegantly formed and distinct, the posterior deeply divided and irregular, making it difficult to determine their number. They are retractile within a single cavity.

Mouth small, with two flat tentacular appendages, united above so as to form a subquadangular veil [oral tentacles flattened and broadly angulated; Brit. Conch., v. 87.]

[Müller's fig. 2, of pl. xlvii measures exactly one inch.]

Corpus elongatum subtus glabrum album, supra lamina repanda obtectum; et corpus et lamina, aliquantum pellucet.

Lamina supra convexis inaequalibus, papillulas simulantibus, ac in sulphureum vergentibus, subtus vero venulis creberrimis non in omnibus aequè conspicuis exornatum est.

In medio versus postica punctum maius laminae concolor; ex hoc lobus confusus serratus, *an*i ornamentum, protruditur.

In ipso corpore nec os, nec caput diu detegere potui; antica demum corporis pars in orbiculum porrigebatur; hic *caput* medio rima longitudinali seu ore notatum, loboque auriculari utrinque iuxta basin adauctum obtulit.

The coincidences in these two descriptions are remarkable. Both note the transparency of the body, the wide expansion of the notaeum or "cloak," Müller actually describing it as *repanda*, the sulphur-yellow of the tubercles, the remarkable distinctness of the veining underneath the notaeum, and the confused nature of the serrations of the branchial plumes. Alder and Hancock do not state that the

tubercles are "inaequales," but they make them very distinctly so in their illustration, while the comparatively inconspicuous nature of the branchiae comes out equally in the pictures by both authors. There appears to be some contradiction in the two descriptions of the rhinophores, Müller stating that the *tentaculum* is "simplex," while Alder and Hancock observe that it is "beautifully laminated." The explanation appears to lie in the fact that Müller was not able to see more than the apex or nipple of the rhinophore, which, as commonly in the *Doridæ*, is bare of lamellae. He expressly says "raro exseritur *tentaculum* simplex, at vix ultra lineam." The coincidence of description with regard to the mouth and head lobes is very remarkable, for there is no other English *Doris* which in the least resembles *repanda* in this respect.

- P. 88. DORIS PROXIMA, A. and H.—Dr. Jeffreys adds, in square brackets, "Bornholm Isle, in the Baltic (Meyer and Möbius)." The addition is unfortunate. All that M. and M. state (*Fauna der Kieler Bucht*, i, p. 70) is, that they placed specimens of *D. proxima* in a tank reserved for animals found on the coast of Bornholm, and that they did not seem to mind the diminished salinity of the water.
- P. 88. DORIS MURICATA, Müll.—The reference to O. F. Müller's *Zoologia Danica* should be replaced by the earlier description in Zool. Dan. Prod., p. 229.
- P. 89. DORIS ULIDIANA, Thomps.—It does not appear to have been stated by the author of the species, or by any subsequent writer, that *Ulidia* is an old Latin name for Ulster, *Ultonia* being its more usual form.
- P. 90. DORIS BILAMELLATA, L.—The reference to the 12th edition of the "*Systema*" must be replaced by the following: *Limax bilamellatus*, Linné, Fauna Suec., ed. 2 (1761), p. 508, no. 2094.
- P. 92. DORIS SPARSA, A. and H.—For "xviii, p. 294" read "xviii (1846), p. 293."
- P. 93. DORIS PILOSA, Müll.—For "Müll. Zool. Dan., iii, p. 85, f. 5-8" read "O. F. Müller, Zool. Dan., iii (1789), p. 7, pl. 85, f. 5-8." The date is important, since there is an earlier edition (1779-84) of the *Zoologia Danica*.
- P. 93. DORIS QUADRANGULATA, A. and H.—This is a most remarkable blunder. In both the references given, A. and H. describe *Doris subquadrata*. No such species as *quadrangulata* was ever described by them.

BRITISH NUDIBRANCHIATA.

- Sub-order ASCOGLOSSA.
- Family 1 **HERMAEIDAE.**
- Genus **Hermaea**, Lovén.
H. bifida (Mont.).
H. dendritica (A. and H.).
- Genus **Stiliger**, Ehrenberg.
S. bellulus (d'Orb.).
- Genus **Alderia**, Allman.
A. modesta (Lovén).
- Family 2 **ELYSIIDAE.**
- Genus **Elysia** (Risso) auctt.
E. viridis (Mont.).
- Family 3 **LIMAPONTIIDAE.**
- Genus **Limapontia**, Johnston.
L. capitata (O. F. Müller).
L. depressa, A. and H.
- Genus **Acteonina**, Quatrefages.
A. corrugata, A. and H.
- Genus **Cenia**, A. and H.
C. cocksii, A. and H.
- Sub-order NUDIBRANCHIATA.
- Sect. I. **Nudibranchiata Kladohepatia.**
- Family 1 **AEOLIDIIDAE.**
- Sub-family 1 **Aeolidiidae proper.**
- Genus **Aeolidia**, Cuvier.
A. papillosa (L.).
- Genus **Aeolidiella**, Bergh.
A. glauca (A. and H.).
A. alderi (Cocks).
A. sanguinea (Norman).
- Genus **Berghia**, Trinchese.
B. caerulescens (Guérin Mén.).
- Sub-family 2 **Cratenidae.**
- Genus **Cuthona**, A. and H.
C. nana (A. and H.).
? C. aurantia (A. and H.).
- Genus **Cratena**, Bergh.
C. pustulata (A. and H.).
C. amoena (A. and H.).
C. viridis (Forbes).
[includes *arenicola*, A. and H. + *glotensis*, A. & H.]
C. olivacea (A. and H.).
C. concinna (A. and H.).
? C. peachii (A. and H.).
? C. stipata (A. and H.).
? C. couchii (Cocks).
? C. paradoxa (Quatref.).
[otherwise *angulata* A. and H.¹]
- Sub-family 3 **Tergipedinae.**
- Genus **Tergipes**, A. and H.
T. despectus (Johnst.).
- Genus **Embletonia**, A. and H.
E. pulchra (A. and H.).
E. minima (Forbes and Goodsir).
E. pallida (A. and H.).
- Genus **Amphorina**, Quatrefages.
A. caerulea (Mont.).
A. molios (Herdm.).
- Genus **Galvina**, A. and H.
G. exigua (A. and H.).
G. tricolor (Forbes).
[including *farrani*, A. and H. + *amethystina*, A. and H. + *adelaidae*, Thomps.]
G. picta (A. and H.).
G. cingulata (A. and H.).
[including var. *vittata*, A. and H.]
- Sub-family 4 **Coryphellidae.**
- Genus **Coryphella**, Gray.
C. rufibranchialis (Johnst.).
[including *pellucida*, A. and H. + *gracilis*, A. and H. + *smaragdina*, A. and H.]
C. landsbergii (A. and H.).
C. lineata (Lovén).
- Sub-family 5 **Favorinidae.**
- Genus **Favorinus**, Gray.
F. albus (A. and H.).
[probably including *carneus*, A. and H.]
- Sub-family 6 **Facelinidae.**
- Genus **Facelina**, A. and H.
F. drummondi (Thomps.).
F. coronata (Forbes and Goodsir).
F. punctata (A. and H.).
- Sub-family 7 **Flabellinidae.**
- Genus **Calma**, A. and H.
C. glaucoides, A. and H.
- Sub-family 8 **Fionidae.**
- Genus **Fiona**, Hancock and Embleton.
F. marina (Forsk.).
- Sub-family 9 **Antiopidae.**
- Genus **Antiopa**, A. and H.
A. cristata (delle Chiaje).
A. hyalina (A. and H.).
- Genus **Proctonotus**, A. and H.
P. mucroniferus, A. and H.
- Sub-family 10 **Heroidae.**
- Genus **Hero**, Lovén.
H. formosa (Lovén).
- Family **LOMANOTIDAE.**

¹ Bergh, by a clerical error, over and over again prints this species as *cingulata*.

Genus **Lomanotus**, Verany.
L. genei, Ver.
 [including *marmoratus*, A.
 and H. + *flavidus*, A.
 and H. + *portlandicus*,
 Thomps. + *varians*,
 Garst. + *hancocki*, Nor-
 man.]

Family **DOTONIDAE.**

Genus **Doto**, Oken.
D. coronata (Gmel.).
D. fragilis, Forbes.
D. pinnatifida (Mont.).
D. cuspidata (A. and H.).

? Genus **Hancoekia**, Gosse.
H. eudactylota, Gosse.

Family **DENDRONOTIDAE.**

Genus **Dendronotus**, A. and H.
D. frondosus (Ascanius).

Family **SCYLLAEIDAE.**

Genus **Scyllaea**, Linné.
S. pelagica, L.

Family **PLEUROPHYLLIDI-
IDAE.**

Genus **Pleurophyllidia**, Meckel.
P. lovénii, Bergh.

Family **TRITONIIDAE.**

Genus **Tritonia**, Cuvier.
 (Sub-genus **Tritonia proper.**)
T. hombergii, Cuv.
 (Sub-genus **Candiella**, Gray.)
T. plebeia, Johnst.
T. lineata, A. and H.
T. alba, A. and H.

Doubtful or insufficiently
 characterised species.

Eolida purpurascens,
 Fleming.

Eolis inornata, A. and H.

Sect. II. **Nudibranchiata Holo-
hepatica.**

**Doridæ Crypto-
branchiatae.**

Sub-family 1 **Archidoridae.**

Genus **Archidoris**, Bergh.
A. tuberculata (Cuv.).
A. flammea (A. and H.)

Sub-family 2 **Discodoridae.**

Genus **Rostanga**, Bergh.
R. coccinea (A. and H.).

Sub-family 3 **Dialululidae.**

Genus **Aldisa**, Bergh.
A. zetlandica (A. and H.).
 ? *A. millegrana* (A. and H.).

Sub-family 4 **Cadlinidae.**

Genus **Cadlina**, Bergh.
C. obvelata (O. F. Müll.).

Sub-family 5 **Kentrodoridae.**

Genus **Jorunna**, Bergh.

J. johnstoni (A. and H.).

Sub-family 6 **Platydoridae.**

Genus **Platydoris**, Bergh.
P. testudinaria (Risso).
**Doridæ Phanero-
branchiatae.**

Sub-family 1 **Polyceridae.**

Genus **Aegires**, Lovén.
A. punctilucens (d'Orb.).

Genus **Triopa**, Johnston.

T. claviger (O. F. Müll.).

Genus **Crimora**, A. and H.

C. papillata, A. and H.

Genus **Thecacera**, Fleming.

T. pennigera (Mont.).

T. virescens, A. and H.

T. capitata, A. and H.

Genus **Palio**, Gray.

P. lessonii (d'Orb.).
 [including var. *ocellata*, A.
 and H.]

Genus **Polycera**, Cuvier.

P. quadrilineata (O. F.
 Müll.).

Sub-family 2 **Goniodoridae.**

Genus **Acanthodoris**, Gray.

A. pilosa (O. F. Müll.).

A. subquadrata (A. and
 H.).

Genus **Adalaria**, Bergh.

A. proxima (A. and H.).

A. lovénii (A. and H.).

Genus **Lamellidoris**, A. and H.

L. bilamellata (L.).
L. muricata (O. F. Müll.).
 [including *aspera*, A. & H.]
L. diaphana (A. and H.).
L. sparsa (A. and H.).
L. depressa (A. and H.).
L. inconspicua (A. and H.).
L. oblonga (A. and H.).
L. pusilla (A. and H.).

? *L. ulidiana* (Thomps.).

? *L. maculata* (Garst.).

Genus **Goniodoris**, Forbes.

G. nodosa (Mont.).

G. castanea (A. and H.).

Genus **Idalina**, F. S. Leuckart.

(Sub-genus **Idalina proper.**)

I. elegans, F. S. Leuck.

I. leachii, A. and H.

(Sub-genus **Idaliella**, Bergh.).

I. aspersa, A. and H.

I. pulchella, A. and H.

I. inaequalis, Forbes.

I. quadricornis (Mont.).

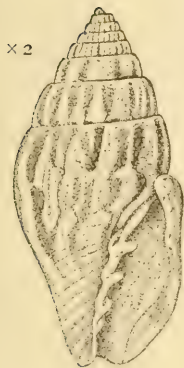
Genus **Ancula**, Lovén.

A. cristata (Alder).

DESCRIPTION OF A NEW SPECIES OF MITRA (M. BALDWINII) FROM THE HAWAIIAN ISLANDS.

By JAMES COSMO MELVILL, M.A., F.L.S.

Mitra (Strigatella) baldwinii, n. sp.



M. testa ovato-fusiformi, nitida, perlævi albida, solidiuscula, anfractibus ad decem, in speciminibus nostris decollatis, gradatulis, apud suturas impressis, supernis arcté longitudinaliter, lævicostatis, interstitiis obscuré spiraliter striatis, tribus ultimis lævibus, flaminis longitudinalibus brunneo-castaneis conspicuis depictis, ultimo anfractu cæteros magnoperé superante versus basim spiraliter multilivato, apertura oblonga, intus striata, cinerea, labro incrassato, sinuoso, lævi, columella albescente, quadruplicata.

Long. 24. Lat. 11 mm.

Hab.—Ad insulus Hawaiïenses (Baldwin.).

This very elegant *Mitra* is conspicuous amongst its congeners for its extremely smooth surface, delicate appearance, longitudinal chestnut flame-like markings on a white ground, and for its neatly graduated whorls, the uppermost four or five being very closely and smoothly longitudinally ribbed, the narrow interstices between the costæ also smooth.

A member of the typical section of the subgenus *Strigatella*, its nearest affinities lie with *paupereula*, L., *retusa*, Lam., and *zebra*, Lam. (= *virgata*, Reeve), but all these are coarse shells, and will be seen at once to differ widely when compared with the description given of *M. baldwinii*, in many salient points, notably in the sculpture of the upper whorls.

Four examples alone, so far, would appear to have reached this country. Of these, one has been for a considerable period housed in our National Collection at South Kensington, unnamed, but this is in very imperfect condition.

A second was presented by Mr. Baldwin to Mr. Thomas Rogers of Manchester, some little time back from Honolulu Harbour, also being in an uncharacteristic state, but this was followed, quite recently, by two beautiful and almost perfect examples, precisely similar both in size and colouration, consigned also to Mr. Rogers, who kindly handed them to me for identification. It is curious that both these

specimens, otherwise so perfect, should have an identical fracture towards the upper portion of the outer lip, also slight decollation of the apical whorls.

It is with much pleasure that I connect the name of its discoverer, Mr. D. D. Baldwin, of Haiku, Maui, Hawaiian Islands, with so interesting a shell.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

8TH MEETING, MARCH 10TH, 1899.

The President in the chair.

The following were elected members of the Society:—

Messrs. F. W. Carpenter, and William Moss, F.C.A.

The following nomination for membership was read :

Mrs. Walter E. Collinge.

EXHIBITS.

On behalf of Mr. E. R. Sykes the following specimens were exhibited : *Helix virgata* var. *nigrescens*, Grat., from quarry on top of Portland; monstrosities of *Planorbis complanatus* from Belgium; *Pisidium loreni*, Cless., interesting from the fact that they were collected on the Zermatt at an altitude of 8400 feet; and specimens of the animal and shell of *Ephippodonta macdougalli*, Tate, from South Australia.

On behalf of Mr. F. W. Carpenter a specimen of the shell of *Paryphanta busbyi*, Gray, from New Zealand.

By the President: Specimens of *Paryphanta hochstetteri*, Pfr., from New Zealand, in alcohol.

By Mr. Guy Breeden: Light and dark coloured varieties of the shells of *Helix lapicida* from North Devon; also shells of *Pupa umbilicata* from Braunton, North Devon, *P. anglica* from Co. Down, Ireland, *P. secale* from Birdlip Woods, near Cheltenham, and *P. marginata* from Sutton Park.

By Mr. J. F. Partridge: Shells of *Helix virgata* including a very fine series of varieties, from North Devon.

9TH MEETING, APRIL 14TH, 1899.

The President in the chair.

New Member elected:—

Mrs. Walter E. Collinge.

The following nominations for membership were read:—

Messrs. W. Weaver Jones and L. G. Parsons.

The following gentlemen were nominated by the Council for election as honorary members:—

Dr. Henry Fischer and Prof. H. A. Pilsbry.

EXHIBITS.

By the President: Specimens of *Limax transylvanicus*, Heyn., *L. schwabi*, Fraenkel, and *Arion empiricorum* var. *bicolor*.

By Mr. F. J. Partridge: Specimens of *Limnaea peregra* which had left their shells; also *Pholus dactylus*, *P. candida*, *P. parva*, and *Tapes pullastra*, all from Exmouth.

By Mr. W. J. Harrison, Jun.: A large series of shells from the Upper and Lower Lias, Chalk, and Oxford Clay.

By Mr. H. H. Bloomer: A large series of shells from the Middle Lias, Napton on the Hill, which included some very fine specimens of *Modiola scalprum*, showing various stages of growth.

10TH MEETING, MAY 12TH, 1899.

The President in the chair.

The following were elected members of the Society:—

Messrs. W. Weaver Jones and L. G. Parsons.

The following were elected honorary members of the Society:—

Dr. Henry Fischer and Professor H. A. Pilsbry.

The Secretary announced the addition to the Library of thirteen pamphlets presented by the President.

EXHIBITS.

By Mr. Guy Breeden: A very large collection of land shells from Devonshire records of all of which were placed on the Society's list.

By Mr. H. H. Bloomer: A collection of marine shells from Rhyl.

By the President: Animal and shell of *Borus ovatus*.

11TH MEETING, JUNE 9TH, 1899.

The President in the chair.

PAPER READ.

"Some notes on the Anatomy of *Chitonellus fasciatus*," by Walter E. Collinge, F.Z.S.

In an interesting discussion which followed, Messrs. G. Breeden and Weaver Jones took part.

EXHIBITS.

By the President: *Chitonellus fasciatus*.

By Mr. Breeden: Varieties of the shells of *Helix aspersa* from various localities. Extremely thin shells of *H. nemoralis*, from St. Austell, Cornwall, also a series of darts of British *Helicidae*.

By Mr. Bloomer: *Helix aspersa*, *nemoralis*, *hortensis*, *itala*, *pisana*, *acuta*, and *Cyclostoma elegans*, all from Tenby; also from Knowle, Warwickshire, *Succinea putris* and *elegans*, *Limnaea auricularia* and *stagnalis*, and *Planorbis carinatus* and *umbilicatus*.

The Secretary will be pleased to receive, for the Library, copies of any papers on the Mollusca.

CURRENT LITERATURE.

Owing to the large number of papers awaiting review, the Editor is compelled, for want of space, to restrict the notices of Current Literature to papers actually received.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. ii, vol. xii (pts. 45, 46), pp. 1—112, pls. i—xxviii (except xxvi, issued with last volume).

Continuing his study of *Drymæus*, Mr. Pilsbry first deals with the species of the West Indies, Trinidad, and Florida, which, he points out, are "undoubtedly derived from the group of allied forms in Venezuela and the adjacent region." He next passes to the species of Mexico and Central America, and concludes his review of this very difficult genus by a survey of the subgenus *Leiostræus*, which he restricts to "a natural group of tree snails prominent in the province of Bahia, Brazil." We feel, however, considerable doubt whether, there being a prior *Leiostræa* "of the same derivation and significance," two such names can be in use at the same time in Zoology.

We then pass to the subfamily *Orthalicinæ* which he divides into two main groups; (1) early whorls pitted, (2) early whorls smooth or nearly so. Of the genera, *Orthalicus* belongs to the first, and *Liquus*, *Orystyla*, and *Porphyrocaphe* to the second group. The study of *Orystyla* is then commenced and the present portion concludes with the species of the Antilles and Florida.

We note *Drymæus sallei*, n. sp. from Haiti (p. 11), and new varieties of *D. virginialis*, *D. multifasciatus*, *D. vincentinus*, and *Orystyla undata*.—E. R. SYKES.

Greppin, Ed.—Description des Fossiles du Bajocien supérieur des environs de Bâle. Mém. Soc. Paléont. Suisse, Genève, 1898, vol. xxv, pp. 1—52, pls. i—v.

This is a good and interesting work, illustrated by some capital plates. The author deals only with Cephalopods and Gastropods; and he says that the scope of his work is "to give an exact description of species which appear to be new and to complete the diagnosis of those which are little known." The manner in which the author has accomplished his task is excellent, though we may make certain remarks: they are not intended as fault finding, but merely as suggestions.

In the necessary stratigraphical introduction the author notes that, following the example of Oppel, he has divided the Inferior Oolite into six zones. But much greater perfection in the matter of the subdivision of the Inferior Oolite has been attained within the last seven or eight years in other countries with considerable advantage to palæontology. It is reasonable to suppose that the fifty-eight beds which the author enumerates could be subdivided with similar detail.

The palæontographical portion of the work opens with descriptions of *Belemnites*, though no figures are given. It is satisfactory to see that the author partially recognises the desirability of generic subdivision of *Belemnites*; though he only puts such a title as *Megabuthis* in brackets. It is obvious enough that such species as *giganteus*, *gingensis*, and *blainvillei* belong to three distinct genera: they differ from each other in more than specific characters, and it is time that this was fully recognised in the nomenclature. But though the sulcate *blainvillei* is generically distinct from its non-sulcate contemporaries, it is obviously descended from non-sulcate ancestors; and this is a point which the generic nomenclature should recognise. The difficulty here indicated consists mainly in the choice of a suitable generic distinction.

Of the Ammonites the author figures a *Lioceras* sp., with a colour band. It may be suggested that the species is not of the family to which *Lioceras* belongs, but is one of the *Sonnininae*. He gives an excellent series of figures of *Sphaeroceras polyschides* with a long description. But why does he speak therein of "*Sp. Brooki*" when he means *broeckii*? And when he says "that *Brooki* approaches *Steph.*

Humphriesi in a way, and forms the passage between that species and *Sp. polyschides*, and at the same time the passage between the genera *Stephanoceras* and *Sphaeroceras*," he shows great misapprehension as to Ammonite characteristics, and particularly as to the genetic development of these particular forms.

Many species of Gastropods are figured and described. Among them are six new species belonging to the genera *Tornatella*, *Pseudocerithium*, *Trochus* (*Ziziphinus*), *Ampullaria* and *Littorina*. By the name *Ziziphinus* the author seems to indicate that the genus *Trochus* requires subdivision, and there can be no doubt that the Jurassic Gastropods assigned to the genera *Trochus* and *Turbo* are much in need of generic rearrangement.

In his synonymy of *Amberleya ornata* the author makes a small slip. He credits Sowerby with naming the shell *Littorina ornata*, but he called it *Turbo ornatus*. Other details in the synonymy might call for criticism. For instance *Belemnites blainvilliei*, d'Orbigny, and Phillips, are not the same species; nor are *Am. braikenridgii* of Sowerby, and d'Orbigny. In fact Sowerby's *braikenridgii* has not yet been satisfactorily identified.—S. S. BUCKMAN.

Kobelt, W.—Studien zur Zoogeographie. II Die Fauna der Meridionalen Sub-region. 8vo, pp. x+368, Wiesbaden: 1898, C. W. Kreidel.

As a wide and comprehensive review of the Mollusca in this particular region Dr. Kobelt's "Studies" leave little to be desired. In addition to the Mollusca, which occupy a large portion of this volume, the author treats of the Amphibia, Reptilia, and Mammalia also.

The region dealt with, which is divided up into a series of faunistic divisions, includes the Pontic countries, the Caucasus, Mesopotamia, Persia, Arabia, the Mediterranean, the Tyrrhenian Province, Italy, the Balkan Peninsula, Asia Minor, Syria, Palestine, and Egypt. In arriving at the boundaries of the faunistic provinces, particular stress is laid upon the geology and configuration of land and water, as it appears at the present time, and the condition which obtained in previous periods.

So far as the recent Molluscan fauna is concerned, Dr. Kobelt finds that in its salient features there is a greater agreement with the flora, than with either the Reptilia or Mammalia, though more so with the former group than the latter. The present fauna shows evidence of having arisen from pre-tertiary and new tertiary faunas, especially the latter, in which the influence of separate centres of evolution is clearly discernible, these giving rise to the different characters of the local faunas of the present time.—W. E. C.

Appellöf, A.—Über das Vorkommen innerer Schalen bei den achtermigen Cephalopoden. (Octopoda). Bergens Museums Aarbog, 1898, No. xii, pp. 1—15, Tf. 1—2.

The absence of any internal shell in the Octopoda has hitherto been regarded as one of the chief points of difference from the Decapoda. In the paper before us the author describes the presence of two narrow chitinous rods in *Octopus*, *Eledone*, and *Cirrotheuthis*, which are situated in a cavity on the dorsal surface of the mantle, the cavity being lined by epithelium which secretes these concentrically laminated rods.—W. E. C.

Choffat, P.—Les Ammonées du Bellasien, des Couches à Neolobites Vibrayeanus, du Turionien et du Sénonien. Recueil d'études paléonto. sur la Faune Cretacique d. Portugal, 1898, vol. i (s. 2), pp. 41—86, pls. iii—xxii.

The interest attached to the present paper lies mainly in the description and figures of a new genus of Turonien Ammonites to which the name *Vascoceras* is given. Unfortunately in Portugal the members of this genus are not well preserved, and we venture to think that not a few palaeontologists will regard many of the "new species" as undeterminable from their bad state of preservation. Even the

author at times is in doubt as to the distinctness of certain "species," whilst in other cases the generic position is a matter of doubt. All the specimens have been excellently described and figured, although in not a few instances reliance has had to be placed upon very secondary characters.—W. E. C.

Namias, J.—Collezione di Molluschi Pliocenici di Castellarquato esistenti nel Museo di Mineralogia e Geologia dell' Università di Modena. 8vo, pp. 214. Modena: 1898. Reprinted from the Atti Soc. Naturalisti Modena (s. iii), vol. xv.)

This is a copiously annotated synonymic catalogue of such of the species of mollusca from the Pliocene beds near Castellarquato as are preserved in the Geological Museum attached to the University of Modena.

Castellarquato, which lies between Parma and Piacenza, is a classical spot to the Italian geologist, not much quoted in manuals it is true, though Issel has created the group Piacenzian for the reception of the deposits there. The present collection is the result of the labours of Doderlein, Prof. Pantanelli, and the author, who states that the beds appear to have accumulated in a littoral sea, or one of moderate depth.

The molluscan remains are as abundant as in our own Crag if not more so, and we have counted (unfortunately they are not numbered) 573 species enumerated in the catalogue, whilst there is a further list of 291 species which have been cited as occurring at Castellarquato, but which are not represented in the museum at Modena. By an oversight *Tapes browni*, Mayer, occurs in both, and one would wish that the same classification had been followed in the two lists; but these are minor matters. It is more instructive to compare in certain cases the number of species known and reported for a given genus: thus 2 species of *Proten* occur in the Modena Museum, whilst 20 others have been recorded. *Murex* appears to be the genus best represented, 19 species being in the collection, whilst *Rhaphitoma* possibly comes next with 14; on the other hand but two land-shells appear, an indeterminate species of *Glandina* and *Helix brocchii*.

Our author describes 6 new species: *Admete triplicata* (p. 39), *Mitra postacuta*, and *M. pantanelli* (p. 43), *Dosinia placentina* (p. 169), *Tapes intermedius* (p. 175) and *Gastrea foliosa* (p. 195). Seeing that now-a-days the soundness of conchological work on the continent may generally be reckoned to be in inverse proportion to the percentage of new species founded, this small number is strong evidence of the good quality of Prof. Namias' work. By a clerical error four species of *Scalaridae* have "De Boury n. sp." after them; but, as the synonymy shows, these were described by that author in 1890, and are therefore hardly new.

Unfortunately our author's new species are not accompanied by figures, and there is no index of any sort to the monograph; but apart from these drawbacks, the work is a solid contribution to palaeontological literature, and Prof. Namias is much to be thanked for, and congratulated on, its production.—B. B. WOODWARD.

Siemiradzki, J. von.—Monographische Beschreibung der Ammonitengattung *Perisphinctes*. Palæontographica, 1899, Bd. xlv, pp. 69—352, T. xx—xxvii.

For some time past Dr. J. v. Siemiradzki has been working at the descent of the Upper Jurassic Ammonites, and this work has led him to a revision of the genus *Perisphinctes* which is so numerous represented in the Upper Jurassic rocks. Founded by Waagen in 1869 as a subgenus of *Stephanoceras* and shortly afterwards raised to generic rank by Neumayr, Zittel and Waagen himself, this genus has now become so large that any attempt to classify the forms that have been included in it is not only a very difficult task, but entails a vast amount of labour and research. For the present monograph the author therefore deserves our best thanks. He tells us that in the preparation of the work he has consulted 128 separate publications in German, French, English, Italian, Spanish, Polish, and Russian; and besides his own collection which contains several hundred examples of the genus, he has examined the collections of several private individuals as well as those of various continental

museums. The author has in many cases examined the type-specimens and in some cases when it was not possible for him to do this, he obtained plaster casts of them in order to gain a correct idea of the species. One great difficulty in dealing with this genus is due to the very vague manner in which several specific names, such as *biplex*, *plicatilis*, *polypleurus*, and *polygyratus*, have been used, owing in some cases to the inadequate description or figure of the type-specimen. The author concludes that a precise limitation of the genus from allied genera is not possible and that its limits must be drawn somewhat artificially. Thus *Parkinsonia* is distinguished from *Perisphinctes* by the presence of a median ventral furrow, but as this character occurs in some *Perisphinctes* it cannot be regarded as of generic value, and only those forms must be referred to *Parkinsonia* which combine this character with others, such as the presence of lateral or of ventral tubercles. In other characters *Parkinsonia* resembles *Perisphinctes* and supports Teisseyre's view that *Parkinsonia* is the ancestral form of many of the *Perisphinctes*. This is indirectly confirmed by their geological age, for whilst *Parkinsonia* commences, according to the author, in the Upper Lias, attains its maximum development in the Inferior Oolite, and dies out in the zone of *Oppelia fusca*, true *Perisphinctes* commence in this same zone. Again Neumayr's *Sinuceras* is distinguished from *Perisphinctes* by the presence of a smooth band on the peripheral area, but the author includes in that genus only such forms as possess that character in combination with others, namely the presence of tubercles and the gradually diminishing number of the bifurcating ribs. To the genus *Perisphinctes*, however, the author refers certain species which have frequently been placed in the genus *Hoplites*, reserving for that genus only those forms which in addition to the ventral furrow possess marginal or lateral tubercles; and he transfers to *Oleostephanus* the groups of *stephanoides*, *desmonotus*, *polyptychus* and *virgatus* which some authors have placed in *Perisphinctes*.

There is a short but interesting chapter on the morphology of the shell. Whilst admitting the importance of the character of the remains of former apertures which are preserved on the shell the author does not consider them to possess the taxonomic value that has sometimes been ascribed to them, in fact he considers, and rightly so, that any classification founded upon a single morphological character is arbitrary and unnatural. The author bases his classification upon the principle that the inner whorls of an individual reproduce the morphological characters of the adult of its direct ancestor occurring in the preceding geological stage; but in framing such a classification he has experienced great difficulty owing to the fact that many species of *Perisphinctes* have been hitherto inadequately described, that is to say, all their important morphological characters, such as the character of the inner whorls and of the body-chamber, the details of the suture-line and the precise form of the aperture, have not been given.

The author naturally first paid special attention to the geologically oldest forms of *Perisphinctes*, namely those found in the zone of *Oppelia fusca*, and having carefully differentiated these, sought for their nearest relatives in the next higher geological stage, and so on through each successive stage of the Jurassic rocks. In this way he has grouped the 367 species of *Perisphinctes* which he has recognized, into a number of "Formenreihe" or groups of contemporaneous species, and these again into a number of "Mutationsreihe" or developmental series; these are arranged in six sections and grouped into five subgenera thus: I. *Grossouvría*, n. subgen. (including II. *Biplices*, Sutner), III. *Ataxioceras*, Fontannes, IV. *Perisphinctes*, s. str., V. *Procerites*, n. subgen., and VI. *Choffatia*, n. subgen.

The author gives a description of each species, lateral views of the new forms and of some others are given on the eight photographic plates accompanying the work, an outline of the transverse section of the whorl, a drawing of the suture line of many of the species, and in some cases also of the form of the aperture, being given in the illustrations included in the text.

As defined by the author the genus is exclusively Jurassic, the oldest types appearing in the Inferior Oolite, and only a few species reaching to the Neocomian. He considers that the four principal types, viz., *Grossouvría*, *Perisphinctes*,

Procerites, and *Choffatia*, appear simultaneously in the Inferior Oolite, and therefore that the genus must be polyphyletic. Judging by the character of the inner whorls, *Grossouviria* appears to be derived from *Parkinsonia*, and *Perisphinctes*, s. str., perhaps from the genus *Morphoceras*; *Procerites* undoubtedly from *Stephanoceras* [or *Stephoceras* as has been proposed], s. str., and *Choffatia* probably from many Upper Liassic species of *Colloceras*, while *Atarioceras* and the group of the Biplices are directly descended from *Grossouviria*.

In a monograph of this kind a good index is most important, and it is therefore to be regretted that the index to the present work is somewhat incomplete and imperfect. In the synonymy the references are not always so full as could be desired, and although there is a list of works at the end of the Monograph, this does not always give the required information; the expression *loc. cit.* occurs more frequently than is desirable and sometimes even when quite unnecessary. But notwithstanding these imperfections the author deserves our best thanks for this valuable monograph of a most difficult genus.—G. C. CRICK.

Baker, F. C.—The Mollusca of the Chicago Area. The Pelecypoda. Bull. Chicago Ac. Sci., 1898, pp. 1—130, pls. i—xxvii, figs. 1—10.

The present paper forms the first part of the "Bulletin of the Natural History Survey of the Chicago Academy of Sciences," dealing with the Mollusca, and treats of the Pelecypoda. A second part, to be issued shortly, will report on the Gastropoda.

The area embraced in the survey is about 1800 square miles of land surface, and much useful information is given on the "Topography of the Area," "Localities of special interest," Geographical and Geological distribution, and comparisons instituted between the molluscan fauna of this area and others.

Mr. Baker records in the present report 50 species distributed as below:—

<i>Anodonta</i> ,	3.	<i>Anodontoides</i> ,	2.	<i>Lampsilis</i> ,	11.
<i>Alasmodonta</i> ,	5.	<i>Quadrula</i> ,	8.	<i>Sphærium</i> ,	6.
<i>Strophitus</i> ,	2.	<i>Obliquaria</i> ,	1.	<i>Calymenina</i> ,	4.
<i>Unio</i> ,	2.	<i>Plagiola</i> ,	2.	<i>Pisidium</i> ,	4.

Free use has been made of the writings of Call, Prime, Pilsbry, Simpson, Tryon, Haldeman, and Stimpson, which is duly acknowledged.

The report is illustrated by 27 plates, which, with the exception of the last, are very clear.—W. E. C.

Drew, Gilman A.—Some observations on the Habits, Anatomy and Embryology of Members of the Protobranchia. Anat. Anz., 1899, Bd. xv, pp. 493—519, 21 figs.

This short pamphlet is in the main an abstract of a paper on *Toldia*, now being published in the "Memoirs of the Johns Hopkins University," supplemented by references to two species of *Nucula*. In consequence it suffers from the usual drawbacks of preliminary papers, being interesting enough in matter but curt and aggravating in manner. The paper is divided into two parts. The first describes the coarse anatomy illustrated by a study of the living animal—a combination of anatomy with natural history that one would gladly see more often than one does. In this part several interesting points may be noted (for instance, the food conducting function of the long palp appendages and the pump-like action of the gills), but the feature that stands out in the highest relief is the remarkable variation among the members of the group, a fact that brings home to one the great antiquity and generalized character of their common ancestor. We find for example all the three relations between heart and intestine possible for a Lamellibranch—double and single cerebro-pedal connectives, open and closed oto-cyst, and so on.

The second part deals with a subject hitherto untouched, the embryology of the group. It is largely given up to the description of a curious ectodermic ciliated test, which may possibly represent the velum of other molluscan embryos. The test is formed early, and almost entirely surrounds the embryo, while within it a new ectoderm arises probably "from cells that have wandered in from the surface" (a somewhat vague expression). After some time—100 hours or so—the test with a large part of the stomodæum is shed.

The development of the other organs is little more than touched upon, a fault that will no doubt be remedied in the larger publication. But even in this preliminary paper one would have liked to hear more of the development of the nervous system. Is there, for instance, any sign of duplicity in the early development of the cerebral ganglia, suggestive of fused cerebral and pleural in the adult? A word of praise must be given to the 21 illustrations, which are both clear and artistic.—

R. H. BURNE.

Kennard, A. S. and Woodward, B. B.—A Revision of the Pliocene non-marine Mollusca of England. *Proc. Malac. Soc. Lond.*, 1899, vol. iii, pp. 187—204, figs. 1—4.

A useful and much needed revision. 38 species are enumerated and 12 of the previously recorded species are rejected. *Paludestrina reevei* is a new species, while *Pisidium fontinale*, Drp., and *P. pusillum*, Gml., are new records.—W. E. C.

Melville, J. Cosmo, and Sykes, E. R.—Notes on a third collection of Marine Shells from the Andaman Islands, with descriptions of three new species of *Mitra*. *Proc. Malac. Soc. Lond.*, 1899, vol. iii, pp. 220—29, figs. i—vi.

The new species and varieties are: *Mitra (Chrysame) buryi*, *M. (Costellaria) dilectissima*, *M. (Costellaria) georgii*, *Nassa (Phrontis) zailensis*, Sby., var. n. *andamanica*, *Natica strongyla*, Melv., var. n. *andamanica*.

Snow, Chas. H.—Marine Wood-Borers. *Proc. Amer. Soc. Civil Engineers*, 1898, vol. xxiv, pp. 399—430, pls. xx—xxi.

An excellent and well illustrated paper, written from an engineer's standpoint. Much useful information on the amount and rapidity of the destruction wrought on American coasts by *Teredo*, will be found of interest to malacologists.—C. H.

Fischer, H.—Liste des Mollusques Marins recueillis a Guéthary et a Saint-Jean-de-Luz. *Trav. d. Lab. Soc. sci. et Stat. Zool. d'Arcachon*, 1899, pp. 1—12.

Collett, O.—Contributions to Ceylon Malacology. (2) Description of a new Helicoid Land Shell from the Southern Province. *Journ. R. Asiatic Soc. Ceylon Branch*, 1898, vol. xv, No. 49, pp. 1—2, 1 pl.

Acarvus (Oligospira) poleii, n. sp. is closely applied to *A. waltoni*, Rve., differing however in its somewhat narrower and more solid shell, and by a pure white peristome; further *A. poleii* is restricted to the forests of the Southern Province, a district in which *A. waltoni* is not known to occur.—W. E. C.

Meli, R.—Sulla *Eastonia rugosa*, Chemn. (*Maetra*) ritrovata vivente e fossile nel litorale di Anzio e Nettuno. *Boll. d. Soc. Malac. Ital.*, 1897, vol. xx, pp. 45—64, 1899, vol. xx, pp. 65—73, T. ii, pt.

Meli, R.—Sul *Typhis (Typhinellus) tetrapterus*, Bronn (*Murex*) etc. *Ibid.* 1899, pp. 74—96, T. ii, pt.

Audenino, L.—I Pteropodi Miocenici del Monte dei Cappuccini in Torino. *Ibid.*, pp. 97—114, T. v.

Meli, R.—Ancora poche parole sugli esemplari di *Neptunea sinistrorsa*, Desh. (*Fusus*), pescati nella parte australe del bacino occidentale del Mediterraneo (Algeri). *Ibid.*, pp. 115—24, T. iv.

Meisenheimer, J.—Zur Morphologie der Urniere der Pulmonaten. Zeit. f. wiss. Zool., 1899, Bd. lxxv, pp. 709—724, T. xxxiii, u. 4 figs.

Dr. Meisenheimer here describes the results of an investigation upon the morphology of the primitive kidney of the Pulmonata; briefly these may be summarised as follows: Although differing widely in the Basommatophora and Stylommatophora, the nephridium may be reduced in both cases to a common type, which consists essentially of a simple tube, with an internal, terminal, ciliated cell. Regarding this as the typical form the author finds that in the Basommatophora there are only four cells, one of which, the giant cell, is the true excretory cell; whilst in the Stylommatophora there are a large number of cells all of which are excretory in function. In the former sub-order the ciliated cell retains its excretory function, but in the latter there are a number of these ciliated cells, all of which almost entirely lose their excretory function.

The similarity of this nephridium with the end cells of the nephridial system of the Turbellaria is quite surprising, and sufficiently clear, in the author's opinion, to confirm the view that the ancestor of the mollusc was a Turbellarian-like animal.

W. E. C.

Dall, W. H.—Synopsis of the recent and tertiary *Leptonacea* of N. America and the West Indies. Proc. U. S. Nat. Mus., 1899, vol. xxi, pp. 873—97, pls. 87—88.

Professor Dall here gives a most valuable synoptical review of the *Leptonacea*, the fuller details of which are promised in a volume of the "*Transactions of the Wagner Inst. of Science*" (vol. v, pt. 5). The group is a most perplexing one and malacologists will welcome an attempt at revision. The synopsis and classification of the American species we leave for more lengthy consideration, confining our remarks to the author's introduction in particular.

Anatomically we know very little of the various genera which go to form the *Leptonacea*. Although they cannot be regarded as prototypes, they exhibit many supposed prototypic characters. Commensalism, or parasitism has here probably "produced degeneration accompanied by a revival of atavistic primary characters." Hitherto the "dentition" of the hinge has played an all too important feature in the classification, and we are glad to find that the value of this character is considerably lessened by the author's researches. Dr. Dall finds that often it is indistinctly developed and liable to many variations, due to the dynamic reactions of one tooth upon another, and to inherited tendencies of form. Further, a part or the whole of the hinge may become obsolete, so that to assume, as Bernard has sometimes done, that the position of a dental lamina is in itself sufficient to settle homology, is, in the author's opinion, certainly unsafe.

Eighteen new species are described, of these 9 are founded upon single valves!

W. E. C.

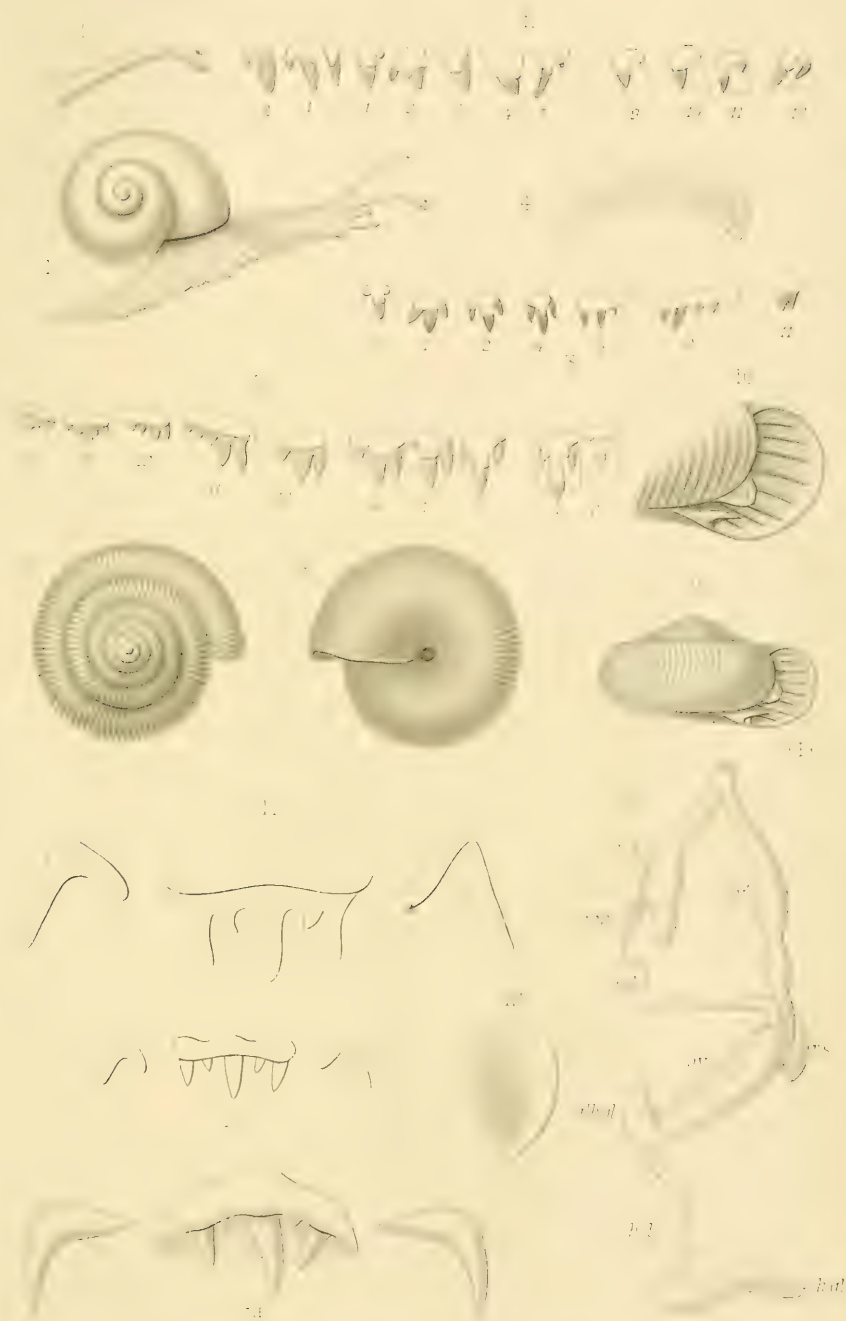
EDITOR'S NOTES.

We regret to have to record the deaths of Sylvanus Charles Throp Hanley on April 5th, 1899, age 80; Franz von Hauer, Director of the Vienna Museum, on March 21st, 1899, age 77, and H. T. Soppitt, on April 1st, 1899, age 40.

At a meeting of the Midland Malacological Society, held on May 12th, 1899, Dr. Henry Fischer and Professor H. A. Pilsbry, were, on the unanimous recommendation of the Council, elected Honorary Members of the Society.

Professor Dr. E. von Martens has recently been elected a Foreign Member of the Linnean Society of London.

The University of Iowa has recently conferred the degree of Doctor of Science upon Professor H. A. Pilsbry.



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VOL. VII.

ON THE ANATOMY AND SYSTEMATIC POSITION OF
SOME RECENT ADDITIONS TO THE BRITISH
MUSEUM COLLECTION OF SLUGS.

By WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

(Plates iv—v.)

THE specimens enumerated in the following pages are some I have recently received from Mr. Edgar A. Smith of the British Museum, to whom my best thanks are due for his kindness in placing the same in my hands, and also for the facilities he has given me for examining the collections under his charge. I also wish to express my best thanks to Dr. Ad. S. Jensen, the able Director of the Malacological Section of the Zoological Museum of the University of Copenhagen, for his kindness in permitting me to examine the type specimens and dissections of *Tebernophorus australis*, Bergh, and for the duplicate specimens he has so generously sent me for purposes of dissection.

ATOXON, Simr.

Atoxon lineatum, Simr.

Hab.—Somaliland, East Africa. Two specimens collected by E. Lort Phillips, Esq.

These are both immature examples of this species. The reproductive organs were not developed, but a comparison of the two individuals with the description and figures given by Simroth (15) leaves little doubt as to their identity.

Length (in alcohol) 36.5 mm.

ANADENUS, Heyn.

A. sechuenensis, n. sp. Pl. iv, figs. 1, 2, 6, 7, pl. v, figs. 8—13.

Animal olive brown with a faint, dark, mid-dorsal band and darker lateral bands. Mantle ovoid, large, marked with a postero-median diamond-shaped, light space, with dark bordering, a few indistinct black spots laterally. Respiratory orifice slightly behind the middle of the mantle. Generative orifice below and behind the right lower tentacle. Rugæ small, irregular in outline, in groups divided by deep black sulci. Peripodial groove small but distinct. Foot-fringe same colour as the body, lineoles almost black. Foot-sole divided into lateral and median planes, the former being dark ashy-grey or blackish, the latter olive brown.

Length (in alcohol) 74 mm.; length of mantle 34.5 mm.; breadth of foot-sole 23.5 mm.

Shell a thin, flat, calcareous plate with no periostracum. Length 12 mm.; breadth 5.5 mm.

Hab.—Sung pan, N. W. Sechuen, China.

ANATOMY.

Digestive System.—This agrees in the main with the description and figure of *A. altivagus*, Theob., given by Pilsbry (14), differing however in a few points. The buccal cavity leads into a short œsophagus, at the point of junction of these two the salivary glands open by their ducts on the dorsal surface. Both of the glands are folded upon themselves and, in the specimen dissected, were partly ventral to the buccal cavity and œsophagus. There is a wide crop which narrows posteriorly and opens into an ill-defined stomach, which is divided into two parts, the hepatic ducts entering posteriorly between the two, here terminates the first loop of the digestive tract; the second loop passes forwards beneath the crop, anteriorly appearing above it, and bending backwards forms the third loop, this is continued backwards beyond the stomach and making a single revolution, returns forwards beneath the stomach as the fourth loop, and passing across the middle of the crop as the rectum it terminates at the anus on the right side (Pl. iv, fig. 6).

The Jaw.—I have to thank the Rev. Professor H. M. Gwatkin, M.A., of Cambridge, for very kindly examining this and the radula. It corresponds exactly with the description given by Pilsbry (14) of that in *A. altivagus*, Theob.

The Radula ($\frac{5.6-1-5.6}{1.31} = 14803$) differs from that in *A. altivagus* in the smaller size of the cusps of the central teeth.

The Retractor Muscles (Pl. iv, fig. 7).—Godwin-Austen (9) and Pilsbry (14) differ from one another in their account of the retractor muscles in *A. altivagus*, Theob. In the main features I can confirm Pilsbry's account, though there are here some slight differences in position from the condition which obtains in the above mentioned species, which the figure (Pl. iv, fig. 7) sufficiently well explains.

Pedal Gland (Pl. v, figs. 8—9).—Lying free in the body cavity, above the musculature of the foot-sole is a long, tongue-shaped gland 17 mm. long and 2.5 mm. broad. At its commencement there is a rounded glandular mass, situated on the dorsal side of the gland and slightly embracing it laterally. I was unable, in the specimen dissected, to satisfy myself of its relation, if any, to the pedal gland.

In transverse section (Pl. v, fig. 9) the lumen appears somewhat triangular in shape bounded by a thick glandular wall. The upper side of the lumen is lined with columnar epithelium cells, the lower with cuboid shaped cells. A transverse section was made through the anterior portion of the gland through the rounded glandular mass mentioned above, but particulars of its structure and its exact relations to the pedal gland must be deferred until more material has been examined.

Pallial Organs (Pl. iv, fig. 7).—These agree in the main with the description given by Godwin-Austen (9) of those in *A. altivagus*. Here, however, the kidney is larger and slightly different in shape. The pyriform shaped ventricle is situated posteriorly, the auricle being directed forwards and slightly towards the right side.

The Generative Organs (Pl. v, figs. 10—13).—The vestibule is small. The vagina is a wide tube with a series of longitudinal ridges on its internal wall (Pl. v, fig. 11). At the commencement of the vagina these parallel ridges are joined by a series of transverse ridges. At about the lower third the thick lip-like opening of the free-oviduct is noticeable, and in front of it the ridges are more pronounced, forming a tongue-like body. The penis is small, 10.5 mm. long in the specimen examined, and somewhat pyriform in shape. The retractor muscle is divided into two parts, the larger division being attached to the distal end of the penis, the smaller passes over the vas deferens and is inserted into the wall of the penis at about its middle (Pl. v, fig. 10). Internally the walls of the penis are seen to consist of a dense muscular coat, covered by a glandular epithelial lining, which form a series of longitudinal ridges proximally, distally the whole of the inner surface is studded with a series of minute fleshy rugosities, and at the extreme distal portion is a thick muscular ring, the penis papilla, also covered with these (Pl. v, fig. 12);

this muscular ring forms the boundary of the opening of the vas deferens into the lumen of the penis. There were no calcareous spicules. The vas deferens is a long, densely coiled tube and at the point where it opens into the common duct it is thrown into a series of convolutions, similar to those which have been described in *Paryphanta busbyi*, Gray, by Godwin-Austen (10) and in *Testacella maugei*, Fér., by myself (6). The receptaculum seminis is a wide sac-like body, the whole of its internal wall being more or less folded. Just before the opening into the vagina the folds have a dense arborescent form, becoming less and less marked distally (Pl. v, fig. 11). There is no receptacular duct. The free oviduct is fairly long and shows a slight constriction just in front of the point where the oviduct ceases. The common duct is thrown into three well defined loops. The albumen gland is small. There is a long hermaphrodite duct and a very large hermaphrodite gland, measuring 23.5 mm. in length.

AFFINITIES.

A. sechuenensis differs from *A. altivagus*, Theob. in the general form of the generative organs, particularly in the smaller size of the penis and receptaculum seminis and the larger hermaphrodite gland; other differences are seen in the points of insertion of the retractor muscle of the penis, the convolutions of the common duct, the shape of the crop, and in the larger size and shape of the kidney.

Anatomical details of most of the described species of this genus are still wanting.

TEBENNOPHORUS, Binn.

Tebennophorus bilineatus, Bens., 1842.

From Chekiang, China, Messrs. J. J. Walker and Basset Smith have collected three specimens of *Tebennophorus*. Both externally and internally these are identical with some I examined from Oahu and Honolulu, Hawaiian Isles, in 1895 (7) and 1896 (8) and which were referred to *T. australis*, Bergh.* The original description of this latter species (2) is not a good one, and unfortunately no figures were given of the external appearance or anatomy, the lingual ribbon only being figured. In 1871 (16) this was supplemented by a figure of the jaw.

Through the kindness of Dr. Ad. S. Jensen I have been allowed to examine the type and dissected specimens of *T. australis*, Bergh, from the Zoological Museum of the University of Copenhagen, also

* The specimens recorded on p. 295, Proc. Malac. Soc. Lond., 1896, vol. ii, as *T. striatus*, Hasselt, should be *T. australis*, Bergh.

some of the duplicate specimens which were collected on the "Galatea Expedition" in 1846, and I have here given two figures of the same (Pl. iv, figs. 4 and 5).

A comparison of the "Galatea" specimens with those from Chekiang, and those from the Hawaiian Isles, shows many external points of difference, thus in the "Galatea" specimens the ground colour is a yellowish-brown and there are three distinct lines of a deeper brown, one in the mid-dorsal line and a lateral one on each side of this. In the British Museum specimens from Chekiang, and in those from the Hawaiian Isles, the median line is absent, or only very faintly represented, while the lateral ones are very irregular, broad, lines with numerous spots and blotches on a yellowish ground. In all three cases the jaw is ribbed and anatomically they are practically identical. This being so, the description given by Bergh is quite inadequate for the species, for so far as external colouring and markings are concerned, it is a most variable one.

Although differing externally as shown above, all three agree so closely anatomically, that at first I was inclined to group them all under *T. australis*, Bergh. A later examination, however, of the external characters of the specimens above mentioned, suggested to me the possibility of certain specimens in the British Museum Collection being also referable to *T. australis*, Bergh, thus I was led to make a very careful examination of what at first appeared to be a series of closely allied species.

The results of this examination leave no doubt in my own mind that they must all be referred to the *T. bilineatus*, Bens., (1) which was described in 1842, and its anatomy described and figured by Keferstein in 1866 (12).

The specimens in the British Museum collection which were examined are as follows:

T. bilineatus, Bens.

Benson's original description is very brief but sufficient to identify the species. There are two examples in the Collection, one from Chusan, the other from Yokohama, Japan, from the "Challenger" collection. Cockerell (5) has named this latter *T. confusus* from the fact that it differs from Benson's species in possessing a jaw which is not ribbed. At the same time he admits that it is like von Martens' figure of *T. bilineatus* (13), and also like Keferstein's figure (*op. cit.* T. i, fig. 5). Now Keferstein's account of the internal structure agrees in the main with that I have given here in rather greater detail, so I think, there can be no question as to Cockerell's *T. confusus* and Keferstein's *T. bilineatus* being identical, and I shall show that the

internal structure of Bergh's *T. australis* and the specimens from the Hawaiian Isles and from Chekiang all agree internally with the description given by Keferstein. The only difference externally in the "Challenger" specimens from any others I have seen of *T. bilineatus*, is the presence of a number of black markings on the dorsum which tend "to form oblique lines running centrally backwards," this, however, I think is only a variation.

T. formosensis, Ckll.

Two specimens in the British Museum from Formosa, have been termed by Cockerell *T. formosensis*, but until structural differences are given these must be referred to *T. bilineatus*, Bens. Heynemann (11) has recorded this last mentioned species from Formosa. I fail entirely to see why these Formosa specimens have been separated from Benson's species, for Cockerell himself states that compared with the Chusan specimen they "do not seem specifically different so far as external characters go." At first, he states, he was inclined to regard it as a geographical race of *T. confusus*, but not having examined the jaw he could not be certain, further seeing that *T. bilineatus*, Bens., has been found in the Chusan Islands it is "highly probable that the Formosa form has a ribbed jaw and is allied thereto" (5, p. 385).

T. campestris, Godwin-Austen.

Five specimens in the British Museum from Dukhun have been referred by Cockerell to this species. Godwin-Austen's original figure is not very clear,* but if these five specimens are the same as his *T. campestris*, I can only, in the absence of any account of the internal structure of *campestris*, regard it as another synonym of *T. bilineatus*, Bens.

T. chinensis, Ckll.

A specimen in the Museum taken 1300 miles up the Yang-tse River, China, has been named by Cockerell *T. chinensis*. It is very like one of the small specimens of *T. australis*, sent me by Dr. Jenson.

T. bilineatus, Benson. Pl. iv, figs. 3—5, pl. v, fig. 14.

Incillaria bilineata, Bens., 1842, Ann. and Mag. N. H., vol. ix, p. 486.

Philomyces (Incillaria) bilineatus, Kef., 1866, Mal. Blatt., Bd. 13, p. 64, T. i, figs. 5—9.

Philomyces australis, Bergh, 1870, Verhandl. Zool. Bot. Gesell., Wien, Bd. xx, p. 863.

* Journ. Asia. Soc. Bengal, 1876, vol. xlv, pl. viii, fig. 3.

Philomycus campestris, Godwin-Austen, 1876, Journ. Asia. Soc. Bengal, vol. xlv, p. 315, pl. viii, fig. 3.

Limacella confusa, Ckll., 1893, Ann. and Mag. N. H. (s. 6), vol. vi, p. 384.

Limacella formosensis, Ckll., 1890, Ibid., p. 384.

?*Limacella chinensis*, Ckll., 1890, Ibid., p. 386.

Hab.—Chekiang, China. Three specimens collected by Messrs. J. J. Walker and Basset Smith.

Animal (Pl. iv, fig. 4) globose anteriorly, tapering posteriorly; ground colour yellow or yellowish-brown, varying to a deep brown, usually with a faint median and two irregular lateral bands, sides of body marked with brownish spots or blotches; colour subject to much variation. Mantle covers the whole of the dorsum. Peripodial groove distinct. Foot-fringe yellowish with brownish lineoles. Foot-sole yellow, not divided into median and lateral planes.

Length (in alcohol) 39 mm., foot-sole 12 mm. broad.

ANATOMY.

The Generative Organs (Pl. v, fig. 14).—The vestibule is a large globose sac, on the inner (left) side of which the penis opens, this organ is a wide muscular tube twisted and folded upon itself, its distal end is expanded and on the under side of this the vas deferens joins the penis (Pl. v, fig. 14, *v.d.*). In all the specimens dissected, the form of the penis was constant, always being expanded at its distal extremity and folded upon itself. The vas deferens is a short convoluted tube lying dorsal to the free-oviduct. The receptaculum seminis is a large somewhat triangular shaped sac, it has a long duct which becomes slightly larger just before opening into the vestibule. The common duct is folded upon itself twice, the oviducal portion being much convoluted. The albumen gland calls for no special mention. There is a long convoluted hermaphrodite duct, and a large hermaphrodite gland divided into a series of lobules.

AFFINITIES.

Respecting the affinities of *T. bilineatus*, I am able to say very little, owing to the lack of any details respecting the anatomy of the majority of species of this genus. In the form and structure of the digestive and generative organs it is related distantly to *T. striatus*, Hass. It is very distinct from *T. carolinensis*, Bosc.

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EXPLANATION OF PLATES IV—V.

- Fig. 1. *Anadenus sechuenensis*, n. sp. View from the right side. $\times 1$.
 Fig. 2. „ „ „ Dorsal view of the same. $\times 1$.
 Fig. 3. *Tebennophorus bilineatus*, Bens. View from the right side.
 Figs. 4—5. Lateral and dorsal views of specimens named *T. australis* by Bergh.
 Fig. 6. *Anadenus sechuenensis*, n. sp. Alimentary canal.
 Fig. 7. „ „ „ Pallial complex seen from below. $\times 2\frac{1}{2}$.
 Fig. 8. „ „ „ Pedal Gland. $\times 2$.
 Fig. 9. „ „ „ Transverse section of the pedal gland.
 Fig. 10. „ „ „ Generative organs.
 Fig. 11. „ „ „ Vagina and receptaculum seminis cut open to show the structure of the internal wall.
 Fig. 12. „ „ „ Penis cut open to show the structure of the internal wall.
 Fig. 13. „ „ „ Spermatophore.
 Fig. 14. *Tebennophorus bilineatus*, Bens. Generative organs.

REFERENCE LETTERS.

<i>a.</i>	Auricle.	<i>ov.</i>	Oviduct.
<i>alb. gl.</i>	Albumen gland.	<i>p.</i>	Penis.
<i>b. c.</i>	Buccal cavity.	<i>p. r.</i>	Retractor muscle of the penis.
<i>cr.</i>	Crop.	<i>ph. r.</i>	Pharyngeal retractor muscle.
<i>d.</i>	Dart.	<i>pr.</i>	Prostate.
<i>d. s.</i>	Dart-sac.	<i>r. m.</i>	Retractor muscle.
<i>f. ov.</i>	Free oviduct.	<i>r. s.</i>	Receptaculum seminis.
<i>h. d.</i>	Hermaphrodite duct.	<i>r. t. r.</i>	Right tentacular retractor muscle.
<i>h. gl.</i>	Hermaphrodite gland.	<i>s. d.</i>	Duct of salivary gland.
<i>int. 1-4</i>	Intestine.	<i>s. gl.</i>	Salivary gland.
<i>k.</i>	Kidney.	<i>st.</i>	Stomach.
<i>l.</i>	Lung.	<i>v.</i>	Ventricle.
<i>l. t. r.</i>	Left tentacular retractor muscle.	<i>v. d.</i>	Vas deferens.
<i>æ.</i>	Cesophagus.	<i>vg.</i>	Vagina.

ON TWO NEW VARIETIES OF CATAULUS NIETNERI, G. & H. NEV., FROM CEYLON.

By OLIVER COLLETT, F.R.M.S.,

Binoya, Watawala, Ceylon.

Cataulus nietneri, from Ceylon, was described by G. and H. Nevill in the "Journal of the Asiatic Society of Bengal" (1871, vol. xxxix, p. 7), and the shell is figured in that Journal (Pl. 1, fig. 7, 7a), and also in the "Conchologia Indica" of Theobald and Hanley (Pl. 146, fig. 4).

As the figures are in each case somewhat poor and indistinct, I have thought that it might serve a useful purpose to give a new figure of the species (Fig. A), together with figures of two new varieties which have occurred to me in the hill-forests of the Island.

The whereabouts of the late Mr. Hugh Nevill's collection being apparently unknown, I have selected for the figure the species of a shell which corresponds as nearly as possible to the original description. This, together with the types of the two varieties figured, has been deposited in the British Museum (Natural History).

C. nietneri, G. & H. Nev., var. **unicolor**, n. v. Fig. B.

Shell larger and more elongated than the type. Whorls more solid, more densely striated and more roughened. Apex golden and horny. The rest of the shell very pale yellow throughout. The conspicuous white flames which ornament the typical form and var. *caperata*, are entirely absent in the present variety, which is rare. Operculum normal.

Alt. 17, diam. max. 6.5 mm.

Hab.—Amongst ferns and forest undergrowth. Ambegamoa, 3000 feet.

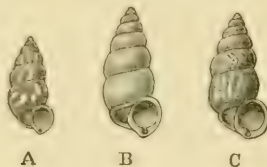


Fig. A. *Cataulus nietneri*, G. and H. Nevill.

Fig. B. „ „ var. *unicolor*, Collett.

Fig. C. „ „ var. *caperata*, Collett.

Cataulus nietneri, G. & H. Nev., var. **caperata**, n. v. Fig. C.

Shell larger and more solid than the type. Whorls more rounded and sutures deeper. Apex smooth and horny. The rest of the shell closely and strongly wrinkled all over, excepting the small flattened portion of the last whorl immediately above the peristome. Operculum as in the type.

Alt. 18, diam. max. 7 mm.

Hab.—Amongst ferns and scrub in marshy places. Fairly common in Ambegamoa, 2000 feet, and Balangoda, 2200 feet.

HELIX (EPIPRAGMOPHORA) KELLETTI, FORBES, AND ITS HABITAT.

By MRS. M. BURTON WILLIAMSON,

Los Angeles, Cal., U.S.A.

THE usual habitat of North American land molluscs is in moist, shady places under layers of fallen leaves, dead trunks of trees, or under stones; but in Southern California, where forests are rare, they must be sought for in other places. The time to obtain the best results in collecting is in the winter after the annual rain has set in, not in the summer time as in the North Eastern States. In little cañons on the south side of low foot hills under loose rocks a few *Epipragmophora traskii* may occasionally be collected, these are more rarely found on the under side of a cactus, but the former habitat is usually the home of this species. There is, however, a species that is invariably found on and under cacti; this species, *E. kelleTTi*, Forbes, is found on Santa Catalina Island, a little island about twenty-three miles off the coast, west of San Pedro Bay, California. The island is mountainous with but little vegetation, and on some of the hills the prickly pear cactus (*Opuntia vulgaris*) grows wild; here *E. kelleTTi* may be found.

The presence of these molluscs are heralded by the sight of a chalk-white shell on the ground, or at the roots of the cactus partly hidden from sight. Summer and winter the cactus bed is the home of this mollusc, sometimes they may be found attached to the under surface of dead branches or on the under side of green branches, which is their favourite habitat in winter. Of all collecting probably there is none that is so likely to keep down any tendency to enthusiasm as snail collecting in a bed of cacti. In the first place the number of living specimens is limited; in the second place they are difficult to capture, a stout stick being necessary in order to bring the plant near enough—not an easy thing to do—to dislodge the shell. This must be done with caution or even gloved hands feel the effect; then there must be constant alertness and caution or shoes and feet are pierced with the sharp prickles and bristles.

How anything so soft and sensitive as the foot and body of a snail can choose its home on the prickly pear cactus is a puzzle. Of course the snail covers its passage with a slime that is a protection, but when we consider that tufts of barbed bristles and long prickles run out in every direction the *Opuntia* is not the kind of plant we would have

selected for its habitat. Probably the scarcity of moisture elsewhere has been the reason why the snail at first sought such a habitat, for, however dry and parched vegetation may seem the prickly pear cactus has abundance of moisture, this is noticeable even in dead branches where the brown sap may be seen oozing out when the decaying mass has been punctured.

E. kellettii is described by Forbes as having a "shell narrowly umbilicated, depressed-globose, wrinkled, granulated, fulvous; spire subturbinated, with dirty reddish blotches and one red revolving band, whorls 6, rather convex, the last with a white band at its periphery and inflated on its under surface; aperture roundly lunate, light red and banded within; peristome somewhat reflected, its columellar portion dilated, reflected, covering the umbilicus. Greater diameter 22, lesser 19 mm.; height 19 mm." The shells vary so much from the type that Mr. Henry Hemphill has named several varieties, such as *castanea*, *nitidus*, *multilineata*, *bicolor*, *tricolor*, *albida*, etc. A shell that is collected from San Diego southward on the mainland known as *E. stearnsiana*, Gabb, is now considered only a variety of *E. kellettii*. The animal of *E. kellettii* is described as of a "bluish slate-colour," but the animals I have seen are nearer a drab, or *café au lait* colour. I have seen none on Santa Catalina Island that might be termed "slate-coloured," so evidently I have not collected the typical form, so far as the animal is concerned.

ON THE RELATIVE CLAIM TO PRIORITY OF PAPUINA WIEGMANNI AND P. TUOMENSIS.

By G. K. GUDE, F.Z.S.

Papuina wiegmanni, v. Mts., from Tuom Island between Kaiser Wilhelmsland and New Britain (Neu-Pommern), having been described by two authors under different names, it is necessary to decide which of the two names has priority.

The circumstances of publication of the work containing the earliest name and description are somewhat peculiar. The third part of volume iii of "*Conchologische Mittheilungen*" in which Professor von Martens first described the shell, was published in 1894, but the part was directly after withdrawn from publication. I was unable to obtain a copy, but Prof. von Martens was kind enough to lend me his,

at the same time giving the following information with reference to it. The publisher, Mr. Theodor Fischer, of Cassel, issued this part with only two plates (43 and 44) instead of six (43—48) as indicated in the text. Under the description of *P. wiegmanni* occurs a reference to plate 46, which is one of the missing ones. A copy of this part (the only other which I have seen) is in the Natural History Museum, Cromwell Road, a fact which indicates that copies were distributed, and the part must therefore be considered as having been duly published. The Museum copy is identical with that sent me by Prof. von Martens.

Mr. C. F. Ancey published the same shell in 1895¹ as a new species under Dr. Boettger's MS. name *Papuina tuomensis*, which name must be discarded, since under the circumstances just mentioned *P. wiegmanni* has priority.

Prof. von Martens afterwards published the species under the same name², giving a literal transcription of his earlier description, but without making mention of it.

The shell was distributed by Mr. Staudinger under Dr. Boettger's MS. name. It belongs to the group of *Papuina tayloriana*, Ad. and Rve., and should be placed next to *P. louisianensis*.

The synonymy should read as follows:

1894.—*Helix* (*Geotrochus*) *wiegmanni*, v. Mts.: Conch. Mitth., iii, 3, p. 10.

1895.—*Papuina tuomensis*, Ancey: Proc. Linn. Soc. N. S. W. (2), x, p. 374, t. 26, f. 3. Var. *heterochroa*, Ancey: *ibid.*, f. 4.

1897.—*Helix* (*Geotrochus*) *wiegmanni*, v. Mts.: Arch. f. Naturg., lxiii, p. 41, t. 8, figs. 1—4.

1899.—*Papuina wiegmanni*, *supra*.

Other species of Mollusca affected by the above mentioned circumstances are:

Aërope beyrichi, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 1. Reference in text to pl. 43, figs. 1 and 2 is erroneous, the figures cited representing *Achatina nitida*, q. v. Arch. f. Naturg., 1897, lxiii, i, p. 35, t. 6, figs. 1—3. Pondo-Land.

Helix cernua, v. Mts.: S. B. Ges. Naturf. Fr. Berlin, 1889, p. 161; Conch. Mitth., 1894, iii, 3, p. 2. Reference in text to pl. 44 is erroneous, the plate cited containing only a figure of *Spatha wissmanni*, q. v. Arch. f. Naturg., 1897, lxiii, i, p. 36, t. 7, figs. 8—10. Great Namaqua Land.

¹ Proc. Linn. Soc. N.S.W., 1895 (2), x, p. 374.

² Archiv für Naturgeschichte, 1897, lxiii, p. 41.

Helix coagulum, v. Mts.: S.B.Ges. Naturf. Fr. Berlin, 1899, p. 160; Conch. Mitth., 1894, iii, 3, p. 3. Reference in text to pl. 44 is erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 37, t. 7, figs. 11—14. Great Namaqua Land.

Helix namaquana, v. Mts.: S. B. Ges. Naturf. Fr. Berlin, 1889, p. 161; Conch. Mitth., 1894, iii, 3, p. 4. Reference in text to pl. 44 is erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 38, t. 7, figs. 1—4. Little Namaqua Land.

Helix retisculpta, v. Mts.: Nachr. D. Malak. Ges., 1889, p. 154; Conch. Mitth., 1894, iii, 3, p. 5. Reference in text to pl. 44 erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 38, t. 7, figs. 5—7. Damara Land.

Achatina nitida, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 7, t. 43, figs. 1—2. Erroneously cited in text as pl. 45, Usambara.

Achatina schrencki, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 8, t. 43, f. 3. Erroneously cited in text as pl. 45. Transvaal.

Limicolaria flammea var. *dimidiata*, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 9, t. 43, figs. 6—7. Erroneously cited in text as pl. 45. Kilima-Njaro.

Spatha wissmanni, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 9, t. 44. Erroneously cited in text as pl. 47. Congo.

Helix hettneriana, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 10. Reference in text to pl. 44, erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 40, t. 7, figs. 15—17. Peru.

Helix naso, v. Mts.: Jahrb. D. Mal. Ges., 1883, x, p. 82; Conch. Mitth., 1894, iii, 3, p. 12. Pl. 46 cited in text not published. Arch. f. Naturg., 1897, lxiii, p. 42, t. 8, figs. 7—8. E. New Guinea.

Cochlostyla finschi, v. Mts.: Conch. Mitth., iii, 3, p. 12. Pl. 46 cited in text not published.

Helix (Geotrochus) heimbürgi var. *finschi*, v. Mts.: Arch. f. Naturg., 1897, lxiii, i, p. 43, t. 8, figs. 5—6. New Britain.

Calycia crystallina, Rve.: v. Mts. Conch. Mitth., 1894, iii, 3, p. 13. Pl. 48 cited in text not published. Arch. f. Naturg., 1897, lxiii, i, p. 43, t. 9. New Guinea.

NOTES.

Subulina octona, Chemn. in Kew Gardens.—Recently I have had sent to me, through the kindness of Mr. I. H. Burkill, living examples of this species found in Kew Gardens. They were found by Mr. G. Nicholson in one of the tropical forcing pits, and there are said to be plenty of young ones, but few adults. A West Indian moth was recently found in a similar pit.

Mr. Cockerell (*Sci. Gossip*, 1893, p. 26) has recorded the species, on the authority of Mr. J. R. Hardy, from hothouses at Manchester.—E. R. SYKES.

Notes on some Specimens of Plectopylis.—Mr. Collinge has been so kind as to send me for inspection the specimens of *Plectopylis* contained in the Theobald collection in the Zoological Museum of Mason University College, Birmingham, with a request that I should make a note of them for this journal.

There are eight shells, of which two pertain to a species recently described by me as new.

1.—*Plectopylis repercuta*, Gould: Proc. Boston Soc. Nat. Hist., 1856, vi, p. 11; Gude: Sci. Goss., 1898, n.s. v, p. 74, f. 78. Two typical specimens measuring: *a.* major diam. 28, min. diam. 23, alt. 10 mm.; *b.* major diam. 29, min. diam. 23·5, alt. 10 mm.

2.—*Plectopylis achatina* var. *repercutoides*, Gude: Sci. Goss., 1899, n.s. v, p. 333. Three specimens measuring: *a.* major diam. 26·75, min. diam. 21·5, alt. 10 mm.; *b.* major diam. 26·25, min. diam. 20·5, alt. 9·5 mm.; *c.* major diam. 24·75, min. diam. 19·75, alt. 9 mm.

3.—*Plectopylis andersoni*, W. T. Blanford: Proc. Zool. Soc., 1869, p. 448; Hanley and Theobald: Conch. Ind., 1875, t. 112, figs. 8-9; Godwin-Austen: Proc. Zool. Soc., 1874, p. 612, t. 74, f. 9; Tryon: Man. Conch., 1887 (2), iii, p. 161, t. 34, f. 71, t. 35, figs. 74-75; Gude: Sci. Goss., 1896, n.s. iii, p. 154, f. 17. One specimen measuring: major diam. 24, min. diam. 21, alt. 9·5 mm.

4.—*Plectopylis magna*, Gude: Sci. Goss., 1897, n.s. iv, p. 70, f. 52. Two specimens measuring: *a.* major diam. 25, min. diam. 20, alt. 8·25 mm.; *b.* major diam. 23·75, min. diam. 20, alt. 9 mm.—G. K. GUDE.

Additional Records to the Mollusca of Carnarvonshire and Merionethshire.—The following land molluscs, recently collected at Nevin, are additions to the county fauna I believe:—*Helix hortensis*, *H. itala* and v. *leucozona*, *H. arbustorum* v. *conoidea*, *H. acuta* and vars. *strigata*, *articulata*, and *alba*. I am also able to add the following species and varieties to Merionethshire, all of which were collected at Aberdovey:—*Helix virgata* and v. *alba*, *H. caperata* v. *fulva*.—H. H. BLOOMER.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

12TH MEETING, SEPTEMBER 12TH, 1899.

The President in the chair.

The following nomination for membership was read:—

Miss A. Litchfield.

PAPER READ.

“On the Anatomical characters of the subgenus *Limacopsis*, Simr.,” by Walter E. Collinge, F.Z.S.

EXHIBITS.

By the President: Specimens and drawings illustrating his paper, also specimens of *Apera burnupi*, E. A. Sm., and *Oopelta nigropunctata*, Mörch.

By Mr. F. J. Partridge: *Arion rufus*, L., from Brussels, *Oncidiella cellica*, Cuv., *Otina otis* and *Vertigo moulinsiana*, all from North Devon.

13TH MEETING, OCTOBER 13TH, 1899.

The President in the chair.

New member elected:—Miss A. Litchfield.

The President directed attention to a very interesting account of the Mollusca of Herefordshire, by Messrs. Boycott and Bowell. A discussion followed upon the nomenclature used, and it was decided to ask the Council to take into consideration the desirability of approaching the Council of the London Malacological Society, with a view to the formation of a thoroughly representative committee, to consider the publication of an authoritative list of the British Mollusca.

EXHIBITS.

By Mr. Bloomer: Shells of *Ampullaria globosa*, Swain., from Jubbulpore, *Planorbis costus*, Desh., from Bengal, *Cyclophorus indicus*, Desh., and *Ariophanta laevipes*, Müll., from Bombay.

By Mr. Guy Breeden: Varieties of the shells of *Helix virgata* and *H. cartusiana*, from various localities.

By the President: The shells of *Ampullaria theobaldi*, *A. glauca*, L., *A. ampullacea*, L., *A. globosa*, Swain., *Vivipara filosa*, Hanley, *V. malleata*, Rve., *V. vivipara*, L., *V. contecta*, Müll., *V. doliaris*, Gld., *V. angularis*, Müll., *V. bengalensis*, Lam., *Paludomus dilatatus*, Rve., *P. loricatus*, Rve., *P. chilinoides*, Rve., also specimens of *Scarabus trigonus*, Tros., and *S. plicatus*, Fér.

14TH MEETING, NOVEMBER 17TH, 1899.

The President in the chair.

The following additions to the Library were announced, for which thanks were voted: 24 pamphlets from Prof. H. A. Pilsbry, and 1 from the President.

The following nomination for membership was read:—

Mr. H. Overton.

PAPER READ.

“Additional Records to the Mollusca of Carnarvonshire and Merionethshire,” by H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Shells of *Helix hortensis*, *H. itala* and v. *leucozona*, *H. arbustorum* v. *conoidea*, and one approaching *flavescens*, *H. acuta* and vars. *strigata*, *articulata*, and *alba*, from Nevin, Carnarvonshire. Also from Aberdovey, *Helix virgata* and v. *alba*, and *H. caperata* v. *fulva*.

By the President: A collection of slugs from Australia, Tasmania, and New Zealand, also specimens of *Xesta novaræ*, Pfr.

By Mr. Overton: *Arion fuscatus*, Nils., *Limax maximus*, and the var. *cinereo-niger*, Wolf, from Sutton Coldfield.

By Mr. Breeden: Shells of *Petricola pholadiformis*, from the Kentish coast.

By Mr. Partridge: Shells of *Melampus bidentatus*, from the River Taw, Barnstaple.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. ii, vol. xii (pt. 47), pp. 113—176, pls. xxix—xlvi, and xxxvii.

Mr. Pilsbry continues his account of the species of *Oxystyla* from Mexico, &c., and then passes to the South American species, of which latter he gives a useful conchological table. He then deals with *Porphyrobaphe* which, he points out, is mainly to be distinguished from *Oxystyla* by the peristome being "thick and blunt or reflexed" and not "thin and acute." So far as known the anatomical differences appear to be unimportant. The concluding portion of the present part deals with *Liguus*, in which genus—apart from *Liguus*, s.s.—he admits as subgenera *Hemibulimus* and *Corona*. The typical forms are Antillean, those of the first subgenus Colombian, the residue being South American. He points out that *Liguus* may be separated from *Orthalicus* and *Oxystyla* by the sculpture of the protoconch. His very careful study of the variation of the shell in the species of *Liguus* will be of great service to the systematist.

We note new varieties of *Oxystyla princeps*, *O. pulchella*, and *O. zebra*.—E.R.S.

Drew, G. A.—The Anatomy, Habits, and Embryology of *Yoldia limatula*, Say. Mem. Biol. Lab. Johns Hopkins Univ., Baltimore, 1899, vol. iv, pp. 1—37, pls. i—v.

In one of our recent numbers we noticed a preliminary paper by Dr. Drew, upon certain members of the *Protobranchia*; now we have before us the finished memoir, in which the life, habits, anatomy, and embryology of *Yoldia limatula* are dealt with at considerable length. As we have already drawn attention to the chief descriptive matter of the preliminary paper, it will perhaps be more advantageous here to take a somewhat broader view, and offer a few remarks upon the general inferences to be drawn from the detailed facts.

It will be remembered that Pelseneer—the author to whom we owe our most comprehensive account of the anatomy of the *Nuculidæ*—was particularly struck by the close similarity of structure and primitive characteristics of the group as a whole. Now the predominant note of Dr. Drew's paper is in direct opposition to this, for he lays stress throughout upon the specialised character of certain organs and the striking divergence in important features between the several members of the family. In fact one gathers from his researches that the *Nuculidæ*, far from forming an extremely primitive homogeneous group, are primitive indeed to a certain extent, as evidenced by the structure of their gills, but have diverged so far from one another in various particulars as to form a decidedly scattered assemblage, with a common ancestor in the dim past, of very generalised structure.

Apart from this general opposition to our previous ideas of the family, it must be noticed that, in dealing with the same species, the accounts of anatomical structure given by our author and Pelseneer are in many cases incompatible with each other, and this too in features by no means trivial, such as the presence or absence of a distinct pleural ganglion, of a posterior aorta, of an external opening to the otocyst, and so forth. Have we here a remarkable instance of individual variation or some error of observation? If the latter be the case it seems probable that the error does not lie with Dr. Drew, for in the first place his material was fresh and plentiful, and in the second his general conclusions with regard to the heterogeneous character of the family have been just lately supported by Stempel's study of *Leda*.

With reference to the primitive nature of *Yoldia*, kept somewhat in the background throughout the paper, we should like to draw attention to a curious and surely primitive condition of the nervous system. The cerebral and visceral commissures are *ganglionic*, and pass imperceptibly into the cerebral and visceral ganglia.

It is interesting to note in the embryological section, which as in the preliminary paper is mainly devoted to the ectodermic test, that the otoliths are formed while

the creature is still within the test, and cannot therefore be foreign bodies. The paper is illustrated by five excellent plates.—R. H. BURNE.

Meisenheimer, J.—Entwicklungsgeschichte von *Dreissensia polymorpha* Pall.
1. Bis zur Ausbildung der jungen Trochophoralarve, pp. 44, 2 folding plates.
Marburg: 1899.

The author points out that amongst the freshwater mussels *Dreissensia polymorpha* occupies a remarkably isolated position, inasmuch as in structure and development it clearly shows the characters of a marine form. He traces the history of its distribution in Europe from before the ice-age, when it was apparently widely distributed throughout North Germany, to the present day when it has spread over the greater part of Europe north of the Alps and the Pyrenees. It seems to have entered England in 1824.

While in some freshwater Pelecypoda the original free-swimming larval form has undergone suppression, and in others a new form (such as the Glochidium of *Uniono*) has been acquired, in *Dreissensia* the larva is still a typical Trochophore. The present part of Dr. Meisenheimer's memoir traces the cell changes from the ovum up to that important larval stage.

The eggs are laid free in the water, where therefore the development takes place. The segmentation is of the spiral type, and our author describes it very fully and compares the stages with those described for *Crepidula* by Conklin, and for the *Unionidae* by Lillie. In addition to outline figures of the segmentation stages the cell-lineage is illustrated by a folding plate representing the descent of each cell graphically up to about the sixtieth generation of the blastomeres. These and the other details given in the paper cannot be abstracted or understood apart from the figures, so we must refer those interested to Dr. Meisenheimer's paper itself for further information.

In conclusion, we welcome this paper not only for its own sake but also as evidence of the good work now being done at the freshwater biological station of Plön in Holstein, an institution of the kind that we certainly ought to have in England before long, either on the Westmoreland Lakes or the Norfolk Broads, or better still one in each of these interesting districts.—W. A. HERDMAN.

Appellöf, A.—Cephalopodon von Ternate. 1. Verzeichnis der von Professor Kükenthal gesammelten Arten. 2. Untersuchungen über *Idiosepius*, *Sepiadarium* und verwandte Formen, ein Beitrag zur Beleuchtung der Hektokotylisation und ihrer systematischen Bedeutung. Abhandl. der Senckenberg. Nat. Gesell., 1898, Bd. xxiv, pp. 561–637, Tfn. xxxii—xxxiv.

This memoir opens with an enumeration of the Cephalopoda collected by Dr. Kükenthal; no new forms are described, but three species (*Octopus vitiensis*, *Octopus mollis*, and *Octopus pictus*) are recorded for the first time from the Indo-Malayan region. The second and much more important section contains an elaborate discussion of the relationships of *Sepiadarium* and *Idiosepius*. The late Professor Steenstrup maintained that the hectocotylisation, if rightly regarded, might always be trusted to lead to a natural classification of the Cephalopoda; and, more especially, that those forms in which the modification affects the dorsal arm or arms would always prove to be more nearly related to each other than to those in which the modification affected the ventral pair. Now in the genera *Idiosepius*, *Sepiadarium*, and *Sepioloidea*, the ventral pair is affected, and hence Steenstrup united them with *Sepia* and *Loligo* rather than with *Sepioloidea* and *Rossia*, to which they bear a strong external resemblance. The late Dr. Brock adduced grounds for doubting this affinity in the case of *Sepioloidea*, but Steenstrup replied to him, maintaining his original thesis. Dr. Appellöf has now in a masterly fashion reinvestigated the whole question. He finds that the peculiar rudimentary shell believed to exist in *Idiosepius* was based on an error of observation; that a functional mantle-connection is absent in all three genera, though present in a rudimentary form as in

Sepioida, whilst the curious Mediterranean *Heteroteuthis* furnishes a connecting link between them and *Rossia*. Several characters of *Idiosepius* and *Sepiadarium*, such as the presence of median and lateral adductor muscles to the mantle, the constitution of the liver-capsule by an undifferentiated muscle layer, and its connection with the mantle, the structure of the testes and liver and arrangement of the salivary glands, are also common to the *Sepioidae*. Other characters again, such as the structure of the radula, the undivided pallial nerve, and the presence of an accessory median mantle adductor, are most easily understood as modifications of the arrangement found in the *Sepioidae*. An anatomical character quite peculiar to *Idiosepius* is the presence of an incomplete right oviduct; the glandular terminal part is as well developed as in the left side, but the internal aperture appears to be absent, so that only the left oviduct is functional; this is probably an inheritance from the cœgopsid stem. Hence it appears that the whole anatomy of these forms, except the position of the hectocotylus, indicates a relationship with *Sepioida* and its allies, rather than with *Sepia* and *Loligo*, and the hectocotylisation cannot be regarded as invariably a safe standard of affinity. In conclusion, Dr. Appellöf proposes the erection of a new family for *Idiosepius*, and would arrange the forms in question as follows:—

Family *Idiosepiidae*:—*Idiosepius*.

Family *Sepioidae*.

Subfamily *Sepiadarini*:—*Sepioloidea*, *Sepiadarium*.

Subfamily *Sepiolini*:—*Sepioida*, *Inioteuthis*, *Stoloteuthis*.

Subfamily *Heteroteuthinae*:—*Heteroteuthis*, *Nectoteuthis*.—W. E. H.

Heath, H.—The Development of *Ischnochiton*. Zool. Jahrb. (Abth. f. Morph.), 1899, Bd. xii, pp. 567—656, T. 31—35, and 5 figs.

Professor Heath is to be congratulated on the completion of this beautifully illustrated and really excellent piece of work.

Ischnochiton (*Stenoradsia*) *magdalensis*, Hinds, which forms the subject of this research, occurs in great numbers on the Californian coast. During the day it is found either half buried in the sand or concealed under loose stones. It is exceedingly sensitive to light and comes out only at night to feed on the vegetation. The eggs are laid in May and June, and unlike any Chiton yet described, it deposits these in the form of "jelly masses," which are strings 3—4 mm. in diameter and about 77 cm. long. As the eggs pass out from the ovary they are surrounded by albumen and become moulded into strings by the lower end of the oviduct. On one side of the string there is a strip of albumen in which the eggs are absent, it is therefore not in a state of tension like the remaining portion which is full of ova, consequently the strings assume a spiral form. A specimen kept in the laboratory showed that about 7 inches of the egg-string was laid per hour. Although a very large number of eggs are deposited—the author estimates the minimum for each individual at 101,804, the average 115,940, and the maximum 193,564—very few develop into adults.

Development proceeds rapidly. The embryo escapes from the egg about the seventh day, and in another ten or twelve days takes on the external characters of the adult. Particular attention has been paid "to the cell lineage, and the external features of the development through the formation of the trochophore and its metamorphosis, up to the assumption of the adult form." The development of the various internal organs is only incidentally referred to in connection with its bearing upon the complete understanding of the external structures, but we are promised a further study of these at a later date.

Not the least interesting part of Professor Heath's work is the chapter devoted to "General Considerations." Of recent years there has been a growing tendency to regard "the early cleavage stages as something more than a mere manifestation of simple mechanical forces." In the origin and position of the various quartettes

in *Ischnochiton* there are many resemblances to the conditions which obtain in certain Annelids, indeed in the early cleavages in many cases they are cell for cell the same, and although in the later stages these cell homologies disappear, in the behaviour of the cell groups and in the structures they give rise to, development proceeds in both cases much along the same path. From these and other considerations the author is of opinion that the resemblances between *Ischnochiton* and the Annelids are more fundamental and closer than are the differences. Discussing the ancestral form of the trochophore, Prof. Heath advances the theory that it "was a quadriradially symmetrical organism whose principal axis corresponds to that of the gastrula, and that the shifting of this axis is secondary." This helps us considerably to understand many of the transformations which the developing Chiton undergoes, and also indicates that both the Chiton and Annelid trochophore are constructed upon essentially the same type. Numerous other points of great interest to the student of molluscan embryology are dealt with, all of which are admirably illustrated.—W. E. C.

Moss, W.—The Genitalia and Radulæ of the British *Hyalinia*. Trans. Manchester Micro. Soc., 1898 [1899], pp. 24—28, pls. iv—v.

This interesting paper records the results of a careful examination of a series of dissections of the terminal ducts of the generative organs of seven species of *Hyalinia*. Five of these species belong to the subgenus *Polita*, Held., viz., *draparnaldi*, *cellaria*, *glabra*, *alliaria*, and *nitidula*, and two to *Zonitoides*, Lehm., viz., *nitida* and *excavata*. Of the *Polita* group, *nitidula* differs widely from the remaining four, which, so far as the principal features are concerned, resemble each other very closely and are classed by the author as the *Cellaria* group. On the other hand *nitidula* is, both as regards its radula and generative organs, strongly differentiated from the *cellaria* type.

Some interesting variations in the terminal ducts of *glabra* are figured and described.

A note on the terminal ducts of *nitida* and *excavata* is reprinted from the "*Journ. of Conchology*," and the curious calcareous penis sheath, present in these two species, is figured for the first time.

The figures, which are reproductions by photo-lithography from photo-micrographs, leave much to be desired, good drawings would, in our opinion, have added greatly to the value of the paper.—W. E. C.

Scharff, R. F.—The History of the European Fauna. Svo, pp. vii + 364, 21 figs. London: 1899, Walter Scott, Ltd.

This work is the outcome of a paper published in 1897 in the "*Proceedings of the Royal Irish Academy*" (3 ser. vol. iv). The original paper has been amplified and improved upon, and certain alterations made. The book opens with a somewhat lengthy introduction, followed by a chapter of Preliminary Considerations, and then follow in order, the Fauna of Britain, the Arctic Fauna, the Siberian Migration, the Oriental Migration, the Lusitanian Fauna, and the Alpine Fauna.

Selecting the British Isles for study, its fauna, broadly speaking, is made up of the following elements: a southern or Lusitanian, which is regarded as the oldest portion, next the Alpine and Oriental migrations, then the Arctic, and finally the Eastern or Siberian. The author endeavours to trace the original home of the different elements of our fauna and the path by which dispersal has been effected.

It is not within our scope to discuss the author's views generally, but we cannot refrain from pointing out one or two points which mark an advance in the discussion of such problems as are here dealt with. Firstly then Dr. Scharff no longer regards the various zoological regions and subregions as immutable, but rather as convenient terms for the time being. The exterminating severity of the Glacial period he

thinks has probably been overestimated, though we cannot agree, as is here done, to overestimating the mildness of the same. Throughout the work there is an enthusiasm which is quite refreshing, and full as it is of pregnant suggestions, it cannot fail to give an impulse to the study of geographical distribution.

In no spirit of fault-finding, but rather as suggestions for a second edition, we would point out that apart from certain overdrawn conclusions, the book suffers from over-wordiness and too much repetition, as a result of which the author's meaning is often obscure. The term "migration" is used in a very loose manner, in not a few instances the term "dispersal" would be better. Finally the Bibliography and Index have been carelessly compiled.

Turning our attention to the Mollusca, which form an important class in dealing with problems of distribution, the author has availed himself largely of Dr. Kobelt's recent work. Not a few of the various references to the molluscs contain inaccuracies, most of which might, with a little more care have been avoided; thus referring to the genus *Arion* on p. 49, it is stated that 6 or 7 species are met with in France, in Spain and Portugal about 10, rough guesses of this character are inadmissible in a work written for the general scientific public. Recent work shows that there are about a dozen French species, and 7 or 8 occurring in Spain and Portugal. Again, on page 299 we learn that "the same number of species [of *Arion*], viz. five, occur in Germany and in England." Now there are certainly 7 English species, probably 8, whilst Ireland adds an additional one; of these 9, all occur in Germany excepting 2, but Germany has in addition at least 3 species which are not known to occur in the British Isles. Over and over again Dr. Scharff dwells upon the distribution of *Geomalacus maculosus* (pp. 5, 49, 99, 102, 115, 298, 299), but we fail to find any reference to a peculiar form of *Arion empiricorum* (var. *bocagei*, Simr.), which has precisely the same distribution. Further instances might be cited did space permit. In conclusion let us freely acknowledge that, in spite of many little imperfections, Dr. Scharff has produced a most interesting and suggestive book, which every zoologist should read.—W. E. C.

Hedley, Charles.—The Mollusca of Funafuti. Pt. I. Gasteropoda, Pt. II. Pelecypoda and Brachiopoda. Mem. Aust. Mus., 1899, vol. iii, pts. 17—18, pp. 397—510, figs. 1—58.

Mr. Hedley opens this valuable account of the Mollusca of Funafuti with some very strong remarks on the "London School" of conchologists, some of which are undoubtedly well deserved. The great wealth of anatomical material which has been, and is still being, cast aside by London and other conchologists is greatly to be deplored. If "the fascinating studies of structure, affinities, higher classification," etc., has no charm for them, they might at least pass on the material to other workers. This is done by the British Museum authorities to a certain extent, as is evidenced in papers by Plate, Godwin-Austen, Collinge, and others.

In pt. I. 287 species and 18 varieties are enumerated, of these 39 species and 4 varieties are new. Three new genera are described, viz., *Obtortio*, *Contumax*, and *Thetidos*.

In part II. 70 species and 5 varieties are enumerated, 5 of the species being new. A new species of Brachiopoda, *Thecidea maxilla*, is also described.

All the new species are figured, in addition to many others.—W. E. C.

Tryon, Henry.—Plant Pests. Vaginula Slugs (*Vaginula hedleyi* and *V. leydigi*). Queensland Agricul. Journ., 1899, vol. v, pp. 1—7, pl.

The Government Entomologist describes how these two slugs have of late increased in numbers round Brisbane. Much damage is done by them in vegetable gardens. The writer suggests that they are importations from some country at present unknown.—C. H.

Buchner, O.—*Helix pomatia*, L. Revision ihrer Spielarten und Abnormitäten mit Hervorhebung württembergischer Vorkommnisse nebst Bemerkungen über falsche Anwendung des Begriffes "Varietät." Jahr. d. Vereins f. vaterl. Nat. in Württh., 1899, pp. 232—79, T. i—iv.

This paper is divided into two parts. The first part consists of a discussion as to the use of the term "variety," and does not seem to reach a more satisfactory conclusion than previous discussions of the same point. Usage has given to the term "variety" a very wide and a very loose signification; and any accurate definition or classification is practically impossible till more is known about the causes and conditions of production of the various deviations from the "typical" form. The ideal classification of varieties must depend on a knowledge of their physiological causation. The author adopts the satisfactory plan of calling the deviations usually classed as "varieties" by the less committal term of "forms."

The second part of the paper consists of an examination of the described varieties of *H. pomatia*: the following is a summary of the author's results: (1) forma *normalis* s. *vulgaris*; last whorl more than two-thirds of and nearly three-quarters of the total altitude; diam. 40 to 50 mm.: (2) forma *inflata*, Hartmann; much bigger and often thinner-shelled than the type, whorls more swollen and more depressed, so that the last whorl is four-fifths to five-sixths of the total height: (3) forma *sphaeralis*, Hartmann; larger and as a rule thicker-shelled than the type, more conical, apex rounded, last whorl about two-thirds of total altitude: (4) forma *plagiostoma*, Buchner; nearly always smaller than the type, fairly high-spined, generally light brown with narrow bands, owing to a downward deviation of the last whorl the mouth is more obliquely elliptical than in the type: (5) forma *turrita*, auctt.: very variable in size, thick-shelled, cone-shaped with a produced spire, last whorl one-half or even one-third of total altitude: (6) forma *grandis*, auctt.; diam. 60 to 68 mm.: (7) forma *parva*, Buchner; diam. 30 to 34. The last two forms coexist with one of the others; besides which we may have specimens of a *sphaeralis-turrita* character: (8) aberratio *sinistrorsa* Rossm.: (9) degeneratio *albescens*; the author admits the existence of genuinely albino specimens; they are as a rule thinner-shelled than normal and the periostracum is usually decayed to some extent, these characters being expressions of the generally pathological state of the animal which is most obviously exhibited in the absence of pigment. If such is really the case, the condition is scarcely aptly described as a "degeneration:" (10) deformatio *scalaris*, Müller. The illustrations (29 in number) are very good.—ARTHUR E. BOYCOTT.

Crick, G. C.—On some new or little-known *Goniatites* from the Carboniferous Limestone of Ireland. Ann. and Mag. N. H., 1899 (s. 7), vol. iii, pp. 429—54, figs. 1—15.

The author here re-describes de Koninck's type specimens of *Goniatites* [= *Pericyclius*] *plicatilis* and *G. [Brancoceras] ornatus*, which he was fortunate enough to identify during a visit to the Museum of the Geological Survey of Ireland. In addition he describes the following new species: *Pericyclius foordi*, *P. trapezoidalis*, *P. rotuliformis*, *P. clanensis*, *P. bailyi*, *P. subplicatilis*, *Glyphioceras cordatum*, *G. corpulentum*, *G. ellipsoidale*, and *Prolecanites lesoni*.—W. E. C.

Crick, G. C.—Note on *Ammonites euomphalus*, Sharpe. Geol. Mag., 1899, vol. vi, pp. 251—56, figs. 1—2.

Mr. Crick has recently examined a specimen of this interesting fossil from the hard Cenomanian Limestone close to Whitlands, west of Lyme Regis, which is carefully described and compared with the specimens described by Sharpe (1854) and Jukes-Browne (1896). Its affinities are briefly described, and for the present it is placed in the genus *Douvilléceras*.—W. E. C.

Pilsbry, H. A. and Cockerell, T. D. A.—*Aslennella*, a new genus of Helices. Proc. Acad. Nat. Sci. Phil., 1899, pp. 188—94, figs. 1—3

Externally there are no characters to separate the members of this genus from *Polygyra*. It is founded upon the characters of the generative organs and lung and kidney. The only species of which the internal anatomy is known is *A. miorhyssa*, Dall. The generative organs resemble those of the *Epiphallogona* or of *Belogona*, "which have undergone degeneration of the dart sack and associated mucous glands." The kidney in *Polygyra*, with few exceptions, is very long, whilst that in *A. miorhyssa* is short, like that of *Epiphragmophora*. A list of species which probably belong to the genus is given, and a key for the determination of known forms, by each author.—W. E. C.

Melvill, J. Cosmo.—Notes on the Mollusca of the Arabian Sea, Persian Gulf, and Gulf of Oman, mostly dredged by Mr. F. W. Townsend, with Descriptions of Twenty-seven Species. *Ann. and Mag. N. H.*, 1899 (s. 7), vol. iv, pp. 81—101, pls. i—ii.

Melvill, J. Cosmo, and Standen, R.—Report on the Marine Mollusca obtained during the First Expedition of Prof. A. C. Haddon to the Torres Straits, in 1888-89. *Linn. Soc. Journ. Zool.*, 1899, vol. xxvii, pp. 150—206, pls. 10—11.

The authors review previous work which has been done in this region. In all they record 449 species, of which 24 are new. A new genus of *Neritidae* (*Magadis*) is described, the type *M. cumeriatha* showing a superficial resemblance to *Fanikoro*, Quoy. A new subgenus of *Pholadomya*, Sby. (*Parilimya*) is described for a shell possessing almost equilateral valves, and the paper concludes with some interesting remarks on the recent species of this genus.—W. E. C.

Melvill, J. Cosmo, and Ponsonby, J. H.—Further Contribution towards a Check-list of the non-Marine Molluscan Fauna of South Africa, with Descriptions of Fourteen new Species. *Ann. and Mag. N. H.*, 1899 (s. 7), vol. iv, pp. 192—200, pl. iii.

Messrs. Melvill and Ponsonby give a series of interesting "Addenda et Corrigenda" to their Check-list recently reviewed in this journal (p. 43). The 14 new species belong to the following genera: *Ennea* 2, *Zingis* 3, *Trachycystis* 3, *Trochomorphia* 1, *Balea* 1, *Pupa* 1, *Curvella* 1, and *Auricula* 2.—W. E. C.

Smith, Edgar A.—On a Collection of Land-Shells from British Central Africa. *Proc. Zool. Soc.*, 1899, pp. 579—592, pls. xxxiii—xxxv.

This is a welcome addition to the literature of the Mollusca of Central Africa. As the author had previously surmised, interesting intermediate links connecting some of the larger species of *Achatina* have been found. In reference to the *Achatinae* Mr. Smith has experienced much difficulty in determining the same. There seems to be a gradual gradation of one species into another. "Each district seems to produce its special race, a modification of some neighbouring form; so that the separation of species becomes more and more difficult through the discovery of intermediate links from every fresh locality." It is much to be regretted that in a case of this character that no attention is paid to the animal and its internal structure.

Forty-four species are enumerated of which 25 are new, these latter are as follows: *Ennea* 2, *Streptaxis* 1, *Helicarion* 2, *Thapsia* 6, *Zingis* 1, *Martensia* 1, *Phasis* 2, *Trochosonites* 1, *Buliminus* 3, *Curvella* 2, *Subulina* 1, *Achatina* 2, and *Pomatias* 1.
W. E. C.

Sykes, E. R.—The Zoological Record, London: 1899. Record vii, Mollusca, pp. 1—79.

Assisted by Messrs. E. A. Smith and G. C. Crick, Mr. Sykes fully maintains the high standard reached in previous numbers of this invaluable publication. We notice that certain papers are quoted under the "Systematic" portion which do not appear in the "Titles," which is somewhat unfortunate. It is interesting, to the systematist, to know the year in which a new species has been described, but such a

reference as "Univ. Geol. Surv. Kansas, iv, p. 497," leaves those who consult the original paper in doubt as to whether the new species there mentioned were described in 1896—7 or 8, for papers published in all these years find mention in the present record. As we have previously pointed out, the addition of the year of publication would greatly add to the value of the record, so also, it would be better to state the actual numbers of the plates in a paper e.g. x—xxi, instead of "twelve plates." Having ourselves found these omissions a disadvantage, we draw attention to the same believing that their inclusion would add greatly to the value of a work which no student of the Mollusca can afford to be without.—W. E. C.

Blanford, W. T.—Note on the Land Mollusca of Bombay. Journ. Bombay N. H. Soc., 1899, vol. xii, pp. 326—28.

Dr. Blanford calls attention to the occurrence, in Mr. Peile's recent list of mollusca found in Bombay Island, of *Nanina* (*Microcystina*) *perrotteti*, Pfr. The *Helix perrotteti* of Pfeiffer is a species inhabiting the Nilgiri Hills, and has been collected there by Dr. Blanford, but it is not the same as the Bombay species, for which, in 1880, he proposed the name *Macrochlamys* (?) *platychlamys*. A specimen of the animal has recently been dissected by Lt.-Col. Godwin-Austen, who finds several differences from the typical *Macrochlamys*, which are of such a nature as to warrant its removal to a separate subgenus. *M. pedina* is also another species which differs from the typical forms of *Macrochlamys*.—W. E. C.

Blanford, W. T.—On *Ariophanta dalyi*, n. subsp., from Mysore, with a note on *Mariella dussumieri* (Val.). Proc. Malac. Soc. Lond., 1899, vol. iii pp. 280—83, 2 figs.

This is evidently allied to *A. cypsis*, Bs., but the shell exhibits so many peculiarities that the author thinks it desirable to give a description of the same and a subspecific name. According to Lt.-Col. Godwin-Austen, who has examined the animal, the generative organs are like those of *A. levipes*, Mull. The paper concludes with a list of the typical sinistral species of *Ariophanta* known to occur in the Indian Peninsula.—W. E. C.

Blanford, W. T.—On some Species of Shells of the Genera *Streptaxis* and *Ennea* from India, Ceylon, and Burma. Proc. Zool. Soc. Lond., 1899, pp. 764—770, pl. L.

The new species are: *Streptaxis laevis*, *S. sculptus*, *S. subacutus*, *S. ravanæ*, *Ennea turricula*, and *E. brevicollis*. Some notes and figures are given of *S. beddomii*, Nev. MS., *E. nagaensis*, G.-A. MS., *E. nilium*, G.-A., *E. canarica*, Bedd., and *E. beddomii*, Blf.—W. E. C.

EDITOR'S NOTES.

Mr. E. R. Sykes, B.A., F.Z.S., F.L.S., has recently been elected President of the Conchological Society.

The Library and Collections of the late M. H. Crosse have recently been sold by auction in Paris. The sale commenced on November 20th and concluded on the 30th.

We regret to have to record the death of Dr. W. D. Hartman which occurred on August 16th, at West Chester, Pennsylvania, at the age of 81. He is perhaps best known by his work on the genus *Partula*, Fér., and his "*Conchologia Cestrica*," treating of the mollusca of Chester county, Pa., U.S.A.

A portrait and full account of his life is given in the October issue of the "*Nautilus*."





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THE LAND SHELLS OF THE CAROLINE ISLANDS.

By O. F. VON MOELLENDORFF, PH.D.

VERY little has hitherto been done for the exploration of the Carolines which, being by no means mere coral atolls but including several islands of comparatively large size and elevated basaltic hills, might be supposed to contain a much more extensive and varied molluscan fauna than the meagre result of the investigations as yet made would lead us to believe. We had an analogous case in the neighbouring group of the *Mariannes*, of which Kobelt gave in 1879 a list of 14 species of land shells. My friend Quadras collected there for a couple of months and the result was that we know now of 74 species, 47 being new to science. He did not go beyond the island of Guam, whilst the northern islands of the groups, Tinian, Saypan, etc., if smaller, present elevations of considerable altitude. In the same way we may expect rich results from a thorough exploration of the Carolines by a specialist. What we know of them at present, is due to the French expeditions of the "Coquille" and "Astrolabe," and some collections made by American missionaries, Captain Brenchley and Mr. Finsch. A German trader, Mr. Etscheid, was kind enough to collect for me in the neighbourhood of the Spanish settlement on Ponape, and especially sent me some bags of vegetable mould from the bush, in which I found a number of minute shells. In 1895 Mr. Kubary returned from New Guinea to his old residence at Ponape and at once began conchological researches. He was the first to collect in the more elevated parts of the islands and although he did not get much higher than about 100 metres, he met at once with a number of novelties of which *Flammulina* and a *Quadrasiella* are the most remarkable. Unfortunately he died in 1896.

On the localities in which Kubary collected he wrote me the following notes: In the North of the island are situated *Mpom* and *Meitsik*, not far from the sea, and opposite to them the small island of *Djokoits*. The soil consists of yellow clay which has been formed by decomposed basalt, and is covered by dense bush. The ground gradually rises to the chain of the hills in the interior. The soil in the bush is covered by a thick layer of mouldering leaves in which the *Partulæ* and bigger *Trochomorphæ* are very common. *Trochomorpha nigritella* and its sub-species *contigua* were found on trees and shrubs, the *Pupinæ* and *Helicinæ* partly in the mould and on *Pandanus* and tree-ferns.

Fam. **NANINIDAE.**

1.—**Lamprocystis palaënsis** (O. Semp.).

Microcystis palaënsis, O. Semp. MS.; C. Semper, Reisen Phil., iii, p. 45, t. 2, f. 16.—*Helix palaënsis*, Pfr., Mon. Hel., vii, p. 94.—*Nanina* (*Microcystis*) *palaënsis*, Tryon, Man. Conch., ii, p. 120, t. 40, f. 37.

Hab.—Pelew Islands (Semper), Yap (Kubary).

An intermediate form between *L. misella*, Fér., of the Mariannes and *pseudosuccinea*, m., of the Philippine Islands.

2.—**Lamprocystis frivola** (Pse.).

Helix frivola, Pease in Tryon, Amer. Journ. Conch., 1866, ii, p. 290, t. 21, f. 3.—Pfr., Mon. Hel., vii, p. 72.—*Helicopsis frivola*, Pse., P.Z.S., 1871, p. 475.—*Nanina* (*Microcystis*) *frivola*, Pfr., Nomencl., p. 37.—Tryon, Man. Conch., ii, p. 118, t. 38, figs. 62—64.

Hab.—Ualan (Pease).

Pfeiffer writes Oualao, Tryon Oualau, but I am sure Pease obtained this species from Ualan or Kusaye, one of the Caroline Islands, from whence he described other species. I do not think Ovalu of the Viti group was meant.

3.—**Kaliella tenuisculpta**, Mlldff.

Kaliella tenuisculpta, Mlldff., Jahresb. Senck. Nat. Ges., 1893, p. 69.

Hab.—Ponape (Kubary).

Most probably introduced from Manila, where it is common in gardens.

4.—**Kaliella doliolum** (Pfr.).

Helix doliolum, Pfr., Mon. Hel., i, p. 50.—*Vitrinocornus doliolum*, Semp., l.c., p. 93.—Tryon, Man. Pulm., i, p. 150, t. 36,

f. 23.—*Kaliella doliolum*, Mildff., J. D. M. G., xiv, p. 268, Verz. Phil., 1898, no. 150.

Hab.—Ponape (Kubary).

Here, as well as at Guam, Mariannes, most probably introduced from the Philippine Islands, on which it is widely distributed.

5.—*Hemiplecta sowerbyana* (Pfr.).

Helix sowerbyana, Pfr., Symb., i, p. 36.—Phil. Icon. i, 2, p. 2, t. 2, f. 1.—Chemn., ed. ii, *Helix*, no. 157, t. 25, figs. 5—6.—Mon. Hel., i, p. 68.—Reeve, Conch. Icon., Hel., no. 386, t. 74.—*Nanina (Rhysota) sowerbyana*, Alb., Hel., p. 61.—Alb.-Marts., Hel., p. 54.—Ad., Gen., p. 224.—Pfr., Nomencl., p. 53.—Martens, Conch. Mitth., 1881, i, p. 93.—Tryon, Man. Conch., ii, p. 29, t. 8, f. 25.—*Helix pachistoma*, Hombr. et Jacq., Voy. Pol. Sud. Atl., t. 3, figs. 10—12.—*Helix hogoleuensis*, Le Guill., Rev. Zool., 1845, p. 187.—Pfr., Mon. Hel., i, p. 329.—*Macrocyclis hogoleuensis*, Ad., Gen., p. 203.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

Prof. v. Martens cites O. Finsch as the collector of this species, but as the late Mr. Kubary told me, he gave the shells collected by him at Ruk to Mr. Finsch, who himself did not collect on that island.

The soft parts of this mollusc have not been studied, but the sculpture of the shell agrees with that of *Hemiplecta* rather than that of *Rhysota*.

Fam. TROCHOMORPHIDAE.

6.—*Trochomorpha (Nigritella) approximata* (Le Guill.).

Helix approximata, Le Guill., Rev. Zool., 1842, p. 139.—Pfr., Mon. Hel., i, p. 206, iii, p. 160.—Chemn., ed. ii, Hel., no. 773, t. 125, figs. 5—6.—*Helix (Trochomorpha) approximata*, Albers, Hel., p. 116.—*Nanina (Discus) approximata*, Alb.-Marts., Hel., p. 255.—*Trochomorpha approximata*, Pease, P. Z. S., 1871, p. 474.—*Tr. (Videna) approximata*, Tryon, Man. Conch., iii, p. 90, t. 18, figs. 64—65.—*Helix marmorosa*, Hombr. et Jacq., Voy. Pol. Sud. Atl., t. 7, figs. 5—8.—*Helix approximata* var. *marmorosa*, Pfr., Mon. Hel., iii, p. 160.—Chemn. ed. ii, t. 125, figs. 7—8.—*Tr. approximata* var. *marmorosa*, Tryon, l.c., t. 18, figs. 66—67.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

The habitats Ternate and Sandwich Islands, as given by Le Guillou and Pfeiffer, are certainly erroneous.

There are no differences to justify the separation of *marmorosa* even as a variety. The distinguishing characters mentioned by Pfeiffer are quite within the range of individual variation.

7.—Trochomorpha (Nigritella) entomostoma (Hombr. et Jacq.).

Helix entomostoma, Hombr. et Jacq., Voy. Pol. Sud. Atl., t. 7, figs. 22—25.—Pfr., Mon. Hel., iv, p. 113.—*Tr. entomostoma*, Pse., P. Z. S., 1871.—Tryon, Man. Conch., iii, p. 79, t. 15, figs. 43—45.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

8.—Trochomorpha (Nigritella) kuesteri (Pfr.)

T. peranguste perforata, orbiculato-convexa, solida, confertim plicato-striatula, fulvo-castanea aut atrofusca, subopaca. Spira plus minusve elevata, lateribus convexis apice obtuso pallidiore. Anfr. 7 lentissime accrescentes, sutura filari disjuncti, convexiusculi, ultimus non descendens, ad peripheriam subacute carinatus, basi convexiusculus, medio subplanatus, circa perforationem subexcavatus, confuse angulatus. Apertura diagonalis, rotundato-triangularis, parum excisa, peristoma rectum, margine supero simplice retrorsum arcuato, saepe deflexo, basali strictiusculo, valde calloso-incrassato, columellari brevissimo, tenui, subexciso.

Diam. maj. 22, alt. 13·5 mm.
 „ „ 20, „ 13·5 mm.
 „ „ 19, „ 12·5 mm.

Diam. maj. 18·5, alt. 11·5 mm.
 „ „ 18, „ 9·5 mm. (Pfr.).

Helix kuesteri, Pfr., Z. f. Mal, 1845.—Chemn., ed. ii, Hel., no. 586, t. 92, figs. 14—15.—Mon. Hel., i, p. 215.—*Tr. kuesteri*, Pease, P. Z. S., 1871, p. 474.—Tryon, Man. Conch., iii, p. 80, t. 15, figs. 48—49.

Var. nov. ex colore: *fulvizona*. Ad carinam taenia fulva cincta.

Hab.—Ponape (Finsch, Etscheid, Kubary).

8a.—Trochomorpha kuesteri sub-sp. *transitans*, nov.

T. umbilico paullo majore, anfr. paullo minus convexis, basi paullo magis applanata.

Hab.—Ponape (Etscheid, Kubary).

8b.—Trochomorpha kuesteri sub-sp. *goniomphala*, Pfr.

T. umbilico magis aperto, carina acutiore, anfr. subplanis aut fere planis, angulo circa umbilicum magis distincto, basi planiore, colore pallidiore (corneo-fulvo).

Diam. 20·5, alt. 9·5 mm. (Pfr.)
 „ 20·5, „ 12·5 mm.
 „ 21, „ 11·5 mm.

Diam. 21·5, alt. 14 mm.
 „ 22, „ 11·5—12 mm.

Helix goniomphala, Pfr., P. Z. S., 1854, p. 147. — Mon. Hel., iv, p. 184. — Tr. (*Nigritella*) *goniomphala*, Marts., Ostas., p. 247. — Tryon, Man. Conch., iii, p. 78, t. 15, f. 34.

Hab.—Ponape (Tryon, Etscheid, Kubary).

Pfeiffer mentioned no habitat at first, later he gave Viti as such on Thomson's authority, which must be erroneous. Tryon states Ponape to be the true locality, but does not mention the collector. I received the form abundantly from Ponape.

8c.—*Trochomorpha kuesteri* sub-sp. *intermedia*, nov.

T. umbilico sat aperto (ut *goniomphala*) sed minus distincte angulato, anfr. $6\frac{1}{2}$ magis convexis quam in sub-sp. *goniomphala* sed minus quam in typo, sutura minus distincte marginata, carina minus exserta.

Hab.—Ponape (Etscheid, Kubary).

The abundant material which I received of all these forms from my friends at Ponape has taught me that *T. kuesteri* and *goniomphala* cannot be separated specifically, but at most as sub-species. Unfortunately the collections, made at different localities in the islands, were not always separated, so that it cannot even be determined whether the different forms are local races connected by transitory varieties or whether they occur promiscuously at the same locality. In the latter case they could not be regarded as sub-species, but would appear to be individual variations. I believe, however, that we have here one of those interesting series of forms, for which Messrs. Sarasin, in their splendid work on the land shells of the Celebes, have introduced the new appellation of "Formenkette," i.e. a chain of forms, the different developments of the type occurring either at horizontally or vertically different localities, being linked by transitory stages on intermediate areas. Among the forms which I name *transitans* and *intermedia* we find specimens which may with equal right be referred to *kuesteri* or to *goniomphala*.

9.—*Trochomorpha (Nigritella) alta* (Pease).

T. imperforata, elate trochiformis, solida, transverse curvatim plicato-striatula, fusca aut brunnea, rarius flavida, opaca. Spira valde elevata lateribus convexiusculis apice obtuso. Anfr. $6\frac{1}{2}$ planulati, sutura per carinam subexsertam marginata disjuncti, ultimus acute carinatus, basi fere planus, medio excavatus. Apertura maxime obliqua, trapezoidea, peristoma rectum, obtusum, margine supero medio valde protracto, basali sigmoideo, intus calloso-labiato, columella valde calloso-incrassata.

Diam. 14·75, alt. 9·5 mm.

,, 15·5, ,, 10 mm.

,, 15·7, ,, 11 mm.

Diam. 16, alt. 9·5 mm.

,, 16, ,, 10·5 mm.

Helix alta, Pease, Am. Journ. Conch., 1868, iv, p. 153, t. 12, f. i.—
Pfr., Mon. Hel., vii, p. 69.—*Tr. alta*, Pse., P.Z.S., 1871,
p. 474.—Tryon, Man. Conch., iii, p. 73, t. 14, f. 91.

Hab.—Ponape (Pease, Etscheid, Kubary).

Pease's description and figure were evidently based on an imperfect specimen, not fully grown. He gives the dimensions as 10·9 mm., with only 6 whorls, and does not describe the peristome. I received adult examples in great numbers and have thought it advisable to publish a new diagnosis. By the absence of perforation, the sigmoid shape of the basal margin of the peristome, and the elevated conical spire, somewhat resembles certain species of *Dendrotrochus* (*Trochonania*, auctt.), but there can be no doubt that it belongs to the group of *Trochomorpha knisteri* and must be referred to the same genus as that species. Unfortunately I have not received living examples of either.

10.—*Trochomorpha (Nigritella) nigritella* (Pfr.).

T. modice sed pervie umbilicata, conoideo-depressa, solidiuscula, plicato-striatula, et lineis spiralibus rugulosis microscopice decussata, aut concolor atrofusca aut basi fusca, taenia angusta infra, altera latione supra peripheriam flavescentibus ornata. Spira conoidea lateribus convexis, plus minusve elevata. Anfr. 6 convexiusculi, sutura submarginata crenulata disjuncti, ultimus acute carinatus, basi convexiusculus, ad umbilicum declivis. Apertura maxime obliqua, securiformis, peristoma simplex, margine supero antrorsum arcuato, valde deflexo, infero bene curvato, sublabiato, reflexo.

Diam. 14·5, alt. 8 mm.

,, 13 ,, 8·5 mm.

Helix nigritella, Pfr., in Phil. Icon., ii, 9, p. 4, t. 6, f. 8—Chemn., ed. ii, *Helix* no. 602, t. 94, figs. 1—4.—Mon. Hel., i, p. 205.—*Tr. nigritella*, Pease, J. de Conchyl., 1870, xviii, p. 400.—P.Z.S., 1871, p. 457 (cum var. *oppressa*).—Tryon, Man. Conch., iii, p. 78, t. 15, figs. 35—37.

Hab.—Ponape (Hochstetter, Pease, Etscheid, Kubary).

The variety *oppressa*, Pse., is merely one of the many individual forms of this variable species. There are more or less elevated variations both of the plain brown and of the banded forms. The convexity of the base changes occasionally to flatness.

10a.—*Trochomorpha nigritella* sub-sp. *contigua*, Pease.

Spira plerumque magis elevata, anfr. 6—7 minus convexi, ultimus basi planulatus aut subconcaus.

Diam. 9, alt. 10 mm. (Pease).
 „ 9.5, „ 8 mm.
 „ 10, „ 10 mm.
 „ 10.5, „ 9.25 mm.
 „ 10.5, „ 9.75 mm.
 „ 11, „ 8 mm. (Pease).
 „ 11, „ 9 mm.
 „ 11.5, „ 10.5 mm.

Diam. 12, alt. 8.5 mm.
 „ 13, „ 8.5 mm.
 „ 13, „ 7.5 mm.
 „ 13.5, „ 10 mm.
 „ 14, „ 10 mm.
 „ 14.5, „ 8.5 mm.
 „ 15, „ 9.5 mm.

Helix congrua, Pease, Am. Journ. Conch., 1868, iv, p. 154, t. 12, figs. 3—4.—*Tr. contigua*, Pease, P.Z.S., 1871, p. 457.—Tryon, Man. Conch., iii, p. 78, t. 15, figs. 38—39.—*Helix contigua*, Pfr., Mon. Hel., vii, p. 289.

Hab.—Ponape (Pease, Etscheid, Kubary).

Pfeiffer has already doubted the validity of Pease's species ("nonne varietatibus *H. nigritellae*, speciei forma pervariabilis, adnumeranda?") and I can only admit it as a sub-species after examination of many hundred examples. The spire is higher on an average, but *T. nigritella* varies likewise in that respect, so that the highest forms of the latter are higher than the lower ones of *contigua*. The base is flat instead of slightly convex, and sometimes even excavated, but there are transitory forms of *nigritella* with almost flattened base. The two races do not seem to live promiscuously in the same locality inasmuch as I received in one box only *contigua*, in another only *nigritella*.

There are more colour varieties of the sub-species than of the type, viz., *atrofusca*, *castanea*, *taeniata*, *brunnea*, *fulva* and *flava*.

Fam. PHENACOHELICIDAE, Suter.

(= **Endodontidae**, Pilsbry, ex parte.)

As I have said elsewhere¹ I consider Pilsbry's arrangement of including the well-defined family of *Phenacohelicidae*, Suter (= *Charopidae*, Hutton) within his *Endodontidae* as a regrettable step backwards. The two families are not only conchologically well distinguished, but have different types of jaw and radula and the *Phenacohelicidae* possess a mucous pore.

11.—*Flammulina (Calymna) nigrescens*, n. sp.

T. anguste perforata, discoidea, tenuis, subpellucida, confertim costulato-striata, lineis spiralibus microscopicis decussata, cuticula nigrescente costulata ad peripheriam subfimbriata obducta, opaca, fusca. Spira plana aut paullum immersa. Anfr. $3\frac{1}{2}$ rapide accrescentes, convexiusculi, sutura profunda disjuncti, ultimus subangulatus,

¹ N. Bl. D. M. G., 1895, p. 157 and 1899, p. 23.

basi convexior. Apertura valde obliqua, ampla, late cordiformis, peristoma rectum, acutum, margo columellaris paulum dilatatus.

Diam. maj. 4.5, min. 3.25, alt. 2 mm.

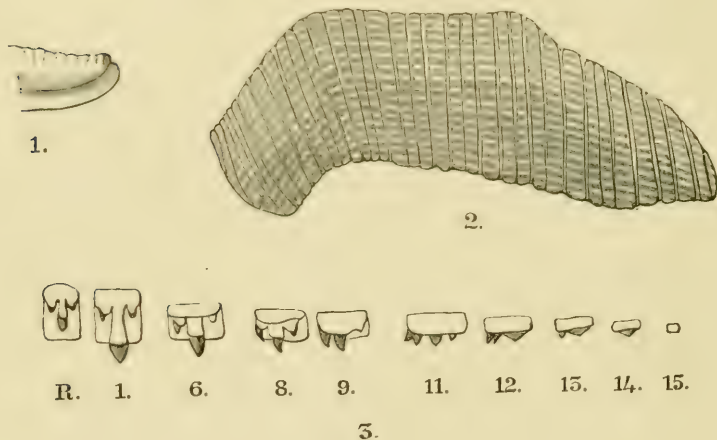
Hab.—Naupilo on Ponape, at about 100 m. altitude (Kubary).

When I received this curious little shell, I felt convinced that it belonged to *Flammulina*, but in order to make sure, I sent it to Mr. Suter who sends me the following as the result of his investigations.

“*Flammulina* (s. str.) *nigrescens*, Mlldff., from Ponape, Carolines.

“Two specimens, containing the dried-up animals, of this very interesting mollusc were kindly sent to me by Dr. O. F. von Moellendorff, suggesting that the species might prove to belong to *Flammulina*, as it resembles very much some New Zealand species with ribbed whorls.

“After immersion in dilute caustic potash the foot of one of the specimens became wholly extended, and I was able to ascertain with certainty the presence of a peripodial groove, a broad pallial margin, and a *caudal gland* (fig. 1).



***Flammulina* (s. str.) *nigrescens*, Mlldff.**

Fig. 1.—Posterior part of foot after immersion in dilute caustic potash, magnified.

Fig. 2.—Jaw. $\times 240$. Drawn with camera lucida.

Fig. 3.—Teeth of radula. $\times 480$.

"The *jaw* (fig. 2) is regularly arcuate, but became somewhat distorted in mounting, hence the different form as shown in my drawing. It consists of numerous, partly unequal, separate vertical lamellae, which are distinctly reticulated by numerous and close transverse striae, a feature sometimes observed in *Gerontia* and *Phasis*, though much less conspicuous.

"The *radula* (fig. 3) has the formula 10-5-1-5-10 and there are about 110 transverse rows of these teeth. The last marginal tooth consists of a minute plate only, the following has a low mesocone, the 13th a small entocone besides the mesocone, on the 12th the entocone is bifid, but there is still no ectocone. The 11th marginal has a minute ectocone, a mesocone and a (not always) bifid entocone. The 10th to 8th marginals become higher and narrower, the ectocone is rudimentary, but the mesocone and entocone are longer, the latter no more bifid. The 7th and 6th tooth may be considered to form the transition to the laterals; the plate is becoming higher, the mesodont longer, with its cutting point reaching beyond the posterior margin of the base, the endodont is better developed than the ectodont. The five laterals have a long mesodont, its cusp extending beyond the base, whilst the side-cusps remain small, the entocone however being a trifle larger.

"The rhachidian tooth, also tricuspid, is narrower, the mesodont more slender and shorter, not reaching to the posterior margin of the plate, and the side-cusps are minute.

"The foregoing shows that it is not only the shell that resembles certain forms of New Zealand *Flammulina*; the presence of a peripodial groove, a caudal pore, the plaited jaw and the radula clearly indicate that it must be classed under *Flammulina*."—HENRY SUTER.

This confirmation of my classification is interesting for two reasons. Firstly it proves that shell characters are not by any means so unimportant as modern malacology tends to consider them, and secondly that the *Phenacohellicidae* extend much more to the North than hitherto known, the most northern habitat observed being New Caledonia.

Fam. **PATULIDAE**, Mlldff.

(**Endodontidae**, Pilsbry, ex parte.)

If we expunge *Flammulina* from Pilsbry's ill-assorted family, there remains no reason to change the name published long before his.

12.—**Charopa ualanensis** (Pease.) em.

Helix oualanensis, Pease, Amer. Journ. Conch., 1866, ii, t. 21, f. i.—

Helix (Punctum) oualanensis, Tryon, Man. Conch., iii, p.

41, t. 8, figs. 62—64.—*Endodonta* (*Charopa*) *oualanensis*,
Pilsbry in Tryon, Man. Conch., ix, p. 35.

Hab.—Kusaye, Ualan (Pease).

I have not seen this species.

13.—*Charopa kubaryi*, n. sp.

T. modice sed aperte et subcylindrice umbilicata, discina, solidula, confertim costulata, brunnea. Spira immersa, leviter concava. Anfr. 4 convexiusculi, sutura profunde impressa disjuncti, ultimus bene convexus. Apertura parum obliqua, ovalis, modice excisa, peristoma rectum, acutum, supra ad insertionem recedens, medio protractum.

Diam. 4, alt. 1·75 mm.

Hab.—Ponape (Kubary).

14.—*Charopa ponapica*, n. sp.

T. mediocriter umbilicata, discoidea, tenuis, costulis bene exsertis acutis flexuosis sat distantibus sculpta, fusca. Spira fere plana, vix prominula. Anfr. 3½ convexiusculi, sutura profunda subcanaliculata disjuncti, ultimus bene convexus, prope suturam subangulatus. Apertura subcircularis, modice excisa, peristoma rectum, acutum.

Diam. 2, alt. 0·9 mm.

Hab.—Ponape (Etscheid).

15.—*Endodonta* (*Thaumatodon*) *callizona*, n. sp.

T. aperte umbilicata, discoidea, solidula, confertim costulata, sericina, superne et basi fusca, ad peripheriam zona lata flavida picta. Spira plana. Anfr. 5 lentissime accrescentes, sutura profunde impressa disjuncti, ultimus lateraliter compressus. Apertura fere verticalis, angusta, peristoma rectum, acutum. Lamellae parietales 3 sat tenues, longe intrantes, intus altiores, palatales 6—7 validae, profundae.

Diam. 2·2, alt. 0·9 mm.

Hab.—Ponape (Etscheid).

Young examples of this pretty little shell possess lamellae which are dissolved in the course of growing. There are some colour variations, the yellow girdle is sometimes divided by a narrow brown band or (rarely) disappears altogether.

Var. nov. *tumidula*. A little higher and more narrowly umbilicated; 2·4:1·3 mm.

Hab.—Mpomp and Naupilo, Ponape (Kubary).

Fam. **EULOTIDAE.**

16.—*Eulota* (*Eulotella*) *miconesica*, n. sp.

T. angustissime perforata, depresso-subtrochiformis, tenuiuscula, subpellucida, subtiliter plicato-striatula, lineis spiralibus microscopicis

decussatula, nitidula, corneo-lutescens. Spira mediocriter elevata, lateribus fere strictis. Anfr. fere 3 convexiusculi, sutura per carinam subexsertam filiformi disjuncti, ultimus ad peripheriam subacute carinatus, antice dilatatus. Apertura sat ampla, fere diagonalis, oblique elliptica, sat excisa, peristoma paullum expansum.

Diam. maj. 13.5, min. 11, alt. 9.2; apert. lat. 7.5, long. 7, alt. 5.5 mm.

Hab.—Ponape, in the hills (Etscheid).

The discovery of this shell was a great surprise, especially as the locality renders the introduction with cultivated plants highly improbable. Also I do not know of any species of *Eulotella* nearly related to it.

Fam. **HELICIDAE.**

17.—*Pupisoma philippinicum*, Mildf.

N. Bl. D. M. G., 1888, p. 108; Jahrb. Senck. Nat. Ges., 1890, p. 223, t. 8, f. 4.—Tryon, Man. Conch., ix, p. 52, t. 14, figs. 43—44.

Hab.—Ponape (Kubary). Most probably introduced from the Philippine Islands, like the *Kaliellae*.

Pilsbry includes this curious genus in the *Patulidae*, but I still believe its nearest allies are *Acanthinula* and *Zoogenites*.

Fam. **PLECTOPYLIDAE.**

18.—*Brazieria velata* (Hombr. et Jacq.).

Helix velata, H. and J., Voy. Pol. Sud. Atl., t. 6, figs. 29—32 (absque descriptione).—Pfr., Mon. Hel., iv, p. 155.—*Trochomorpha velata*, Pease, P. Z. S., 1871, p. 474.—*Helix (Endodonta) velata*, Tryon, Man. Conch., iii, p. 61, t. ii, figs. 89—91.—*Brazieria velata*, Ancey, Conch. Exch., 1887, ii, p. 22.—*Endodonta (Brazieria) velata*, Pilsbry in Tryon, Man. Conch., ix, p. 29, t. 5, figs. 49—51.

Hab.—Hogolu (Hombr. et Jacq., Brazier), Lukunor or Mortlock (Brazier).

As Pilsbry justly says, we cannot regard the generic relationship of this mollusc as established until the soft parts are investigated. However, the conchological characters alone, especially the thickened lip and the parietal callus elevated into a lamella, seem to preclude any relation to *Endodonta* or *Charopa*. I am all but sure that it will prove to be nearly related to *Plectopylis*. We discovered a similar, but much smaller species, in the Philippine Archipelago which I described at first as *Plectopylis*, later as *Brazieria coarctata*.¹

Fam. BULIMIDAE.

19.—*Partula rufa* (Lesson).

Partula rufa, Less., Voy. Coqu. Zool., 1830, ii, 2, p. 324.—Pfr., Mon. Hel., iii, p. 449.—Marts., Conch. Mitth., 1881, i, p. 94.—*Bulimus rufus*, Pfr., Mon. Hel., ii, p. 229.

Hab.—Kusaye, Ualan (Lesson).

Prof. v. Martens declares this species to be identical with the *Partula* of Ponape, which is well known by the name of *P. guamensis*. Lesson's description gives, however, the dimensions as 4:8 lin. or about 9:18 mm. If these measurements were correct, then the *Partula* of Ualan must be a much smaller and more slender shell than *guamensis*. I therefore treat the Ponape races as sub-species.

19a.—*Partula rufa*, sub-sp. *montana*, nov.

Bulimus guamensis, Pfr., Phil. Abb., ii, p. 113, Bul. t. 4, f. 9.—Mon. Hel., ii, p. 13.—*Partula guamensis*, Pfr., Mon. Hel., iii, p. 446.—*P. rufa*, Marts., Conch. Mitth., 1881, i, p. 95, t. 17, figs. 12—16.

Hab.—Ponape, ruins of Nanmatal (Finsch), in the hills (Etscheid, Kubary).

Whorls 5, very distinctly spirally striate, rather solid. Diam. 15, alt. 26 mm. (Pfr.), 16.26 (Marts.), 18.26 (the broadest of my own specimens).

The name *guamensis* cannot be retained inasmuch as this mollusc does certainly not live on the island of Guam, where my friend Quadras collected more than two months without finding it.

19b.—*Partula rufa*, sub-sp. *grandis* nov.

Much larger, diam. 19, alt. 30.5 mm., less solid, spiral sculpture somewhat less marked, peristome more expanded, less labiate, $5\frac{3}{4}$ to nearly 6 whorls.

Hab.—Ponape, coast region (Etscheid, Kubary).

There are three colour variations, viz., dark purple-brown with violet lip (typical), *castanea*, pale chestnut coloured with white lip, and *flavescens*, pale greenish yellow. The last-named albino is rather rare.

Fam. PUPIDAE.

20.—*Vertigo (Ptychochilus) eapensis* (Bttgr.). (rectius yapensis).

Pupa (Ptychochilus) eapensis, Bttgr., in Marts. Conch. Mitth., 1881, i, p. 56, t. 11, f. 11.

Hab.—Yap (Boettger), Palao or Pelew Islands (Kubary).

21.—*Vertigo* (*Ptychochilus*) *ponapica*, n. sp.

T. perforato-rimata, ovato-oblonga, tenuiter et distanter costulata, sericina, brunnea. Spira subtus sub-cylindrica, sursum conoidea, apice obtuso. Anfr. 5 modice convexi, ultimus basi sub-compressus, extus pone aperturam profunde et longe scrobiculato-impressus. Apertura fere verticalis, rotundato-trapezoidalis, peristoma modice expansum, rufo-labiatum, extus distincte sinuatum, marginibus callo tenuissimo junctis. Dentes 6, columellaris recedens; palatales 3, inferi 2 profundi, breves, tertius longus, validus; angularis validus, longe intras, parietalis a margine remotus, angulari approximatus.

Diam. 1, alt. 1.75 mm.

Hab.—Mpomp, Ponape (Kubary).

This minute shell belongs to the group of *V. tantilla*, Gld., and might be considered, like the preceding form, to be merely a representative sub-species of that species widely distributed over Polynesia.

22.—*Leucochilus pediculus* (Shuttl.).

See Bttgr. in Marts., Conch. Mitth., i, p. 65.

Hab.—Yap (Kubary).

Found, according to Boettger, on the Marquesas, Society, Hervey, Samoa, Tonga, Viti, Ellice, Hapai and Marshall Islands, New Caledonia and Hawaii, to which I can add the Mariannes and Philippine Islands. It seems to be easily introduced with cultivated plants.

Fam. STENOGYRIDAE.

23.—*Prosopeas carolinum* (Marts.).

Stenogyra carolina, Marts., Conch. Mitth., 1881, i, p. 93, t. 17, figs. 6—8.

Hab.—Hogolu = Ruk (Kubary).

A rather large species, $5\frac{1}{2}$: 22 mm., related to the Philippine *Prosopeas* like *pagoda*, Semp., and quite isolated in the Micronesian fauna.

24.—*Opeas gracile* (Hutt.).

Hab.—Yap, Ponape (Kubary).

25.—*Opeas tuckeri* (Pfr.).

See Garrett, P. Z. S., 1887, p. 185.

Hab.—Yap, Ponape (Kubary).

Garrett justly includes *Bulimus junceus*, Gld., *walli*, Cox, *diaphanus*, Gass., *souverbieanus*, Gass., *artensis*, Gass., *Stenogyra upolensis*, Mouss., and *novemgyrata*, Mouss., in the synonymy of this widely distributed mollusc, but I doubt very much that *O. panayense*, Pfr.,

is the same species. I consider the Philippine form to be identical with *O. gracile*, Hutt.

26.—*Opeas pruinoseum*, n.sp.

T. vix rimata, ventricosulo-turrita, tenuis, confertim costulato-striata, squamulis membranaceis brevissimis valde deciduis oblecta, sericina, pallide griseo-straminea. Spira turrita lateribus convexiusculis, apice obtusulo. Anfr. 9 convexiusculi sutura sat profunda disjuncti. Apertura verticalis, subrhomboidalis, peristoma rectum, acutum, margine externo antrorsum arcuato, columellari reflexo appresso.

Diam. 4.75, alt. 12.75 mm.

Hab.—Ponape (Etscheid, Kubary).

This species belongs to the group of *O. clavulinum*, Pot. et Mich., but is well characterised by the curious sculpture which gives it a somewhat hoary aspect.

27.—*Tornatellina ovatula*, n. sp.

T. imperforata, conoideo-ovata, tenuis, pellucida, subtilissime striatula, nitidula, pallide lutescens. Spira brevis, conoidea, apice obtuso. Anfr. 4 convexiusculi, sutura crenulata disjuncti, celeriter accrescentes, ultimus magnus, tumidulus. Apertura valde obliqua, ovalis, peristoma rectum, acutum, margine columellari brevissime reflexo, appresso. Lamella parietalis sat elevata, longe spiraliter intrans, columella valde torta, basi profunde excisa bidentata.

Diam. 2, alt. 3 mm.

Hab.—Ponape (Etscheid).

28.—*Tornatellina pusilla*, n. sp.

T. imperforata, elongate ovato-conica, tenuis, pellucida, subtiliter striatula, nitidula, pallide luteocornea. Spira sat elevata, apice obtusulo. Anfr. 4½ convexiusculi, ultimus spiram aequans. Apertura sat obliqua, anguste ovalis, peristoma simplex, acutum. Lamella parietalis sat valida, alta, longe spiraliter recedens, columella subtruncata, valde torta, lamella humili spiraliter recedente munita.

Diam. 1.5, alt. 2.5 mm.

Hab.—Ponape (Etscheid).

29.—*Tornatellina gigas*, Marts.

Conch. Mitth., 1881, i, p. 92, t. 17, figs. 1—5.

Hab.—Hogolu = Ruk (Kubary).

Mr. C. F. Ancey has constituted a separate sub-genus for this aberrant form, viz., *Ochroderma* (Le Natural., 1885, p. 93).

Fam. **SUCCINEIDAE.****30.—Succinea (Brachyspira) guamensis**, Pfr.

Mon. Hel., iv, p. 805.

Hab.—Ponape (Etscheid).

Pfeiffer states Guam as the habitat of this species, but Quadras found no *Brachyspira* on that island. My specimens from Ponape, and from Coror of the Pelew islands are smaller, but otherwise agree well with Pfeiffer's description.

Fam. **AURICULIDAE.****31.—Pythia acuta** (Hombr. et Jacq.).

Scarabus acutus, H. et J., Voy. Pol. Sud. Zool., iv, p. 39, t. 10, figs.

1—3.—*Pythia acuta*, Pfr., Aur., p. 98.

Hab.—Hogolu = Ruk (H. et J.), Ponape (Kubary).

32.—Cassidula philippinarum, Hidalgo.

J. de Conchyl., 1888, p. 53, t. vi, f. 7.

Hab.—Ponape (Kubary).

Fam. **DIPLOMMATINIDAE.****33.—Palaina (Eupalaina) doliolum** (Mouss.).

Mousson in sched., Mlldff., N. Bl. D. M. G., 1897, p. 41.—Kob. et

Mlldff., Cat. Pneum., *ibid.*, 1898, p. 132.

Hab.—Ponape (Mousson, Etscheid, Kubary).

This pretty little shell I received first from Mousson, who never published a description of it; he did not state who collected it. It was found in the bush on Ponape by my collectors in great numbers. By the pale band on the last whorl it resembles *P. taeniolata*, Q. and Mlldff., from Guam. As in that species, young specimens are white, the secretion of colour commencing when the shell is nearly adult. There are some rare colour varieties; uniform reddish or yellow.

34.—Palaina (Eupalaina) kubaryi, Mlldff.

N. Bl., 1897, p. 42.—Kob. et Mlldff., *ibid.*, 1898, p. 132.

Hab.—Ponape, in the hills (Kubary).

Longer than the preceding species, the costulation much narrower, no band, peristome duplicate, not triplicate.

35.—Palaina (Eupalaina) ovatula, Mlldff.

N. Bl., 1897, p. 42.—Kob. et Mlldff., *ibid.*, 1898, p. 132.

Hab.—Ponape (Etscheid, Kubary).

Much smaller, costulate-striate, pale horn-coloured, only 5 whorls.

36.—Palaina (Macropalaina) scalarina (Mouss.).

Mouss. in sched. Mlldff., N. Bl., 1897, p. 43.—Kob. et Mlldff.,
 ibid., 1898, p. 134.

Hab.—Ponape (Mousson, Etscheid, Kubary).

37.—Palaina (Macropalaina) xiphidium, Mlldff.

N. Bl., 1897, p. 44.—Kob. et Mlldff., ibid., 1898, p. 134.

Hab.—Ponape, in the hills (Etscheid, Kubary).

These two species belong to my new section *Macropalaina*, which I proposed for some elongate and acuminate species like *P. pomatiiformis*, Mouss. They both have, at the outer and at the columellar margin of the peristome, a wing-like process, which is much larger on the columella. *P. xiphidium* is longer and has a more slender spire, $\frac{1}{2}$ whorl more, the whorls are more convex, the ribs more distant, the colour darker, and the excision of the columellar margin deeper. I think, however, that intermediate forms may still be found and that *xiphidium* will prove to be merely a sub-species of *scalarina*.

Fam. PUPINIDAE.

38.—Pupina difficilis, O. Semp.

P.Z.S., 1864, p. 252.—J. de Conchyl., 1865, xiii, p. 407, t. 12, f. 8.—
 Pfr., Mon. Pneum., suppl. iii., p. 150.—Kob. et Mlldff.,
 N. Bl., 1897, p. 145.

Hab.—Yap (Kubary), Pelew Islands (C. Semper).

39.—Pupina complanata (Pease).

Registoma complanatum, Pease, P.Z.S., 1860, p. 440.—Pfr., Mon.
 Pneum., suppl. ii, p. 98.—*Rhegistoma complanata*, Marts.
 et Langkavel, Don. Bism., p. 58.—*Pupina (Registoma)*
complanata, Pfr., Pneum., suppl. iii, p. 152.—*Pupina*
(Pupina s. str.) complanata, Kob. et Mlldff., N. Bl., 1897,
 p. 145.

Hab.—Ponape (Etscheid, Kubary), Ebon (Pease), Ialuit (Dr. Steinbach), Marshall Islands.

I believe that Ponape is the original habitat of this species and that it was introduced on the different atolls of the Marshall group with cultivated plants (*Pandanus* or *Musa*). It is certainly not a *Registoma* (= *Moulinsia*), but a true *Pupina* of the typical group of *P. keraudreni*, Vign., the upper "canal" being somewhat obsolete by the slight development of the parietal callus.

40.—Pupina brenchleyi, Smith.

P.Z.S., 1891, t. 40, f. 8. (N. Bl. D. M. G., 1892, p. 176).

Hab.—Lugunor (Smith).

I have not seen this species nor have I been able to compare the description. I suspect it to be but a variety of one of the preceding species which differ very little from each other.

Fam. REALIIDAE.

41.—*Omphalotropis (Eurytropis) bulimoides* (Hombr. et Jacq.).

Cyrtostoma bulimoides, H. et J., Voy. Pol. Sud. Zool., v, p. 52, t. 12, figs. 37—39.—*Hydrocena bul.*, Pfr., Mon. Pneum. suppl., i, p. 162 (ex parte).—*Omphalotropis bul.*, Pfr., ibid. suppl., ii, p. 176.—Pease, J. de Conchyl., 1869, p. 144.—*Realia bul.*, Pfr., Pneum. suppl. iii, p. 220 (ex parte).—*Omphalotropis (Eurytropis) bul.*, Kob. et Mlldff., N. Bl., 1898, p. 149.—*Assimineia bul.*, Marts., Ann. Mag. N. H. (3), xvii, p. 206, cf. Boettger, J. D. M. G., 1887, xiv, p. 215.—Marts., Sitz. Ber. Berlin Akad. Wiss., 1887, p. 264.—*Omphalotropis elongatula* var. *contracta*, Quadr. et Mlldff., N. Bl., 1894, p. 20.

Hab.—Hogolu = Ruk (Hombr. et Jacq.), Yap (Kubary), Guam, Mariannes (Quadr.).

The true *O. bulimoides* was described from the island of Hogolu (=Ruk) and the localities Solomon Islands and New Ireland, as given by Pfeiffer and other authors are very doubtful. My specimens from Yap, which island is situated not very far from Ruk, agree very well with the original description, also with the *Omphalotropis* of Guam, which Quadr. and myself published as var. *contracta* of our *O. elongatula*. If my identification is correct, then *O. elongatula* will have to be considered a sub-species of *bulimoides* and its varieties *brunnescens* and *chrysostoma* (l. c., p. 19) as colour varieties of that sub-species. The forms quoted as *O. bulimoides* from the Solomon Islands and New Ireland most probably belong to other species or are at least to be distinguished sub-specifically; I have not seen them as yet.

42.—*Omphalotropis (Eurytropis) coronata*, Mlldff.

N. Bl., 1897, p. 165.—Kob. et Mlldff., ibid., 1898, p. 149.

Hab.—Yap (Kubary).

Easily distinguished by the series of white callosities or minute knobs along the suture.

43.—*Omphalotropis carolinensis*, Smith.

P.Z.S., 1891, t. 40, f. 9 (N. Bl. D. M. G., 1892, p. 176).

Hab.—Lugunor (Smith).

44.—*Omphalotropis angulosa*, Ancey.

Le Natur., 1890, xii, no. 68, p. 11.

Hab.—Ponape (Ancey.).

45.—*Omphalotropis (Stenotropis) laevis* (Pease.).

Realia laevis, Pease, Amer. Journ. Conch., 1865, i, p. 289, ii, t. 5, f. 5.—Pfr., Mon., Pneum. suppl., iii, p. 227.—*Omphalotropis laevis*, Pease, J. de Conchyl., 1869, p. 148.—Kob. et Mlldff., N. Bl., 1898, p. 151.

Hab.—Ualan (Pease), Ponape (Pease, Etscheid, Kubary).

The name *laevis* is rather a misnomer, there is vertical and spiral striation. The angulation of the last whorl is sometimes developed into an obtuse keel. The colour, which Pease calls "fusco-cornea," varies a good deal from yellowish-horn colour to reddish brown. I count $5\frac{1}{2}$, not 5 whorls, which are not "convexi," but at most "convexiusculi." The preceding species, described by Ancey, is perhaps identical with *laevis*.

46.—*Omphalotropis (Stenotropis) tumidula*, Mlldff.

N. Bl., 1897, p. 168.—Kob. et Mlldff., *ibid.*, 1898, p. 152.

Hab.—Naupilo, Ponape (Kubary).

47.—*Garrettia carolinarum* (Mlldff.).

Diadema carolinarum, Mlldff., N. Bl., 1897, p. 168.—Kob. et Mlldff., *ibid.*, 1898, p. 156.

Hab.—Ponape (Etscheid, Kubary).

The name *Diadema*, Pse., cannot stand, being forstalled by Schumacher 1817 (Crust.), Gray 1825 (Echinod.), Boisd. 1832 (Lepidopt.). Paetel mentions *Garrettia*, Pease, as a synonym of *Diadema*, but I have not been able to find out whether that name was ever published or not. The genus, which was hitherto known from the Society, Harvey, Cook and Viti Islands, has according to Thiele¹ a radula of the type of *Omphalotropis* and belongs, therefore, to the *Realiidae*. The Caroline species agrees well with the Polynesian forms in the general outline and the corneous, multispiral operculum with raised ridges.

47a.—*Garrettia carolinarum* sub-sp. *pyramis*, Mlldff.

Diadema carolinarum var. *pyramis*, Mlldff., N. Bl., 1897, p. 168.

Hab.—Naupilo, Ponape, about 100 m. altitude (Kubary).

Higher, 7 whorls instead of 6, the keel of the last whorl more or less evanescent.

47b.—*Garrettia carolinarum* sub-sp. *turrita*, Mlldff.

Diadema carolinarum var. *turrita*, Mlldff., l. c., p. 168.

Hab.—Meitik, Ponape (Kubary).

Still higher, $7\frac{1}{2}$ whorls, the last without any indication of the perispherical keel.

Without the knowledge of the preceding subspecies I should not have hesitated to describe this form as a separate species. But *pyramis* is exactly intermediate between it and the type and there can be no doubt that *turrita* is merely an extreme development of *carolinarum*.

48.—*Garrettia soluta* (Mlldff.).

Diadema solutum, Mlldff., N. Bl., 1897, p. 169.—Kob. et Mlldff., *ibid.*, 1898, p. 156.

Hab.—Ponape (Etscheid, Kubary).

By its shape and sculpture this remarkable little shell resembles some species of *Heteropoma* (Mariannes and Philippines), but it possesses a corneous multispiral operculum and must, therefore, be classed with *Garrettia*. It is well characterised by the free body whorl, disconnected for about $\frac{2}{3}$ of its length.

49.—*Quadrasiella ammonitella*, n. sp.

T. late et aperte umbilicata, discoidea, sat tenuis, confertim spiraliter lineata. costis crassiusculis distantibus sculpta, opaca, corneolutea. Spira parum emersa, apice mucronato glabrato. Anfr. 4 convexi, sutura profunde impressa, disjuncti, ultimus ad peripheriam nec non infra et supra illam distincte angulatus. Apertura vix obliqua, fere circularis, peristoma rectum, obtusum. Operculum intus corneum, multispirale, extus lamella cartilaginea plicatula, peristoma superante praeditum.

Diam. 3·2, alt. 1·5.

Hab.—Ponape, in the hills (Kubary).

The genus *Quadrasiella* was established by myself for two species discovered by Quadras on the island of Guam,¹ its chief characteristic being the operculum. This consists of an inner corneous lamella which overlaps the peristome somewhat in the manner of *Aulopoma*, and an outer calcareous one which is elongated above and below into a wing-like process. This outer calcareous lamella is wanting in the Caroline species, but the operculum is exactly like the inner lamella of that of *Quadrasiella*. It is possible that the outer lamella, which is easily broken off in the typical species, has fallen off from my two examples

or that they are not quite full grown. The general shape of the shell, the sculpture and the mucronate apex agree very well with the species of Guam, and I have but little doubt that I am right in ascribing the shell of Ponape to *Quadrasiella*.

50.—*Gonatorhaphe incisa* (Hombr. et Jacq.).

Cyclostoma incisa, H. et J., Voy. Pol. Sud. Zool., v, p. 49, t. 12, figs. 11—15.—*Cyclophorus incisus*, Pfr., Mon. Pneum. suppl., i, p. 54.—*Gonatorhaphe incisa*, Kob. et Mlldff., N.Bl., 1898, p. 155.

Hab.—Hogolu = Ruk (Hombron et Jacquinot).

From the meagre description which Pfeiffer made "ex icone," I can only conclude that this species belongs to my genus *Gonatorhaphe*, constituted for certain operculate shells of Melanesia and Polynesia, type *G. reclusiana*, Pfr. They have the general outline of *Cyclotus*, sharp spiral ribs, a more or less canaliculate suture, marginate by a keel or elevated line, and an operculum somewhat like that of *Cyclotus* but without the marginal channel. It has nothing to do either with *Cyclophorus* or *Cyclotus*, but belongs to the *Realidae*.

Fam. TRUNCATELLIDAE.

51.—*Truncatella pacifica*, Pease.

Am. Journ. Conch., 1867, iii, p. 230, t. 15, f. 27.—Pfr., Mon. Pneum. suppl., iii, p. 15.

Hab.—Ualan (Pease), Ponape (Etscheid).

Closely related to *Tr. valida*, Pfr., and perhaps only a subspecies of that widely distributed species.

Fam. HELICINIDAE.

52.—*Helicina (Pleuropoma) humilis*, Hombr. et Jacq.

H. et J., Voy. Pol. Sud. Zool., v, p. 45, t. 11, figs. 27—31.—Pfr., Mon. Pneum. suppl., i, p. 189.

Hab.—Hogolu = Ruk (H. et J.), Ponape (Etscheid, Kubary).

Fresh examples show some spiral, elevated, membranaceous lines, which are easily rubbed off. The operculum is typical of my subgenus *Pleuropoma*.

53.—*Helicina (Pleuropoma) zigzag*, Pse.

Am. Journ. Conch., 1867, iii, p. 229, t. 15, f. 26.—Pfr., Mon. Pneum. suppl., iii, p. 280.

Hab.—Ualan (Pease), Ponape (Etscheid, Kubary).

My examples from Ponape agree in part with Pease's description, but some are larger, up to $9\frac{1}{4} : 5\frac{2}{3}$ mm., thinner and less sharply keeled.

I cannot ascertain whether the latter variety lives with the type or forms a local race on a different part of the island.

54.—*Helicina (Sulfurina) carolinarum*, n. sp.

T. depresso globosa, tenuiuscula, subtilissime striatula, parum nitens, flava, interdum taenia lata ignea ornata. Anfr. $4\frac{1}{2}$ planulati, sutura appressa, submarginata, disjuncti, ultimus ad peripheriam confuse subangulatus. Apertura sat obliqua, rotundato-triangularis, peristoma superne rectum, acutum, basi subexpansum, obtusum, columella brevis, crassiuscula, callum latum, granulosum, emittens.

Diam. 4, alt. 2.75 mm.

Hab.—Ponape (Kubary).

55.—*Helicina zonata*, Less.

Lesson, Voy. Coqu. Zool., ii, 1, p. 350.—Pfr., Mon. Pneum., p. 358.

Hab.—Ualan (Lesson).

Probably a *Pleuropoma* and perhaps identical with or nearly related to *H. zigzag*, Pse.

Fam. HYDROCAENIDAE.

56.—*Georissa rufula*, n. sp.

T. rimata, ovato-conica, solidiuscula, transverse subtiliter striatula, sculptura spirali, sub lente fortiori, haud discernenda, nitidiuscula, rufo-fulva. Anfr. $4\frac{1}{2}$ bene convexi, sutura profunde impressa disjuncti, ultimus paulisper descendens. Apertura sat obliqua, ovalis, peristoma simplex, rectum, obtusum, marginibus callo validiusculo junctis, columella reflexa, valde dilatata, late appressa.

Diam. 1.5, alt. 2.1 mm.

Hab.—Ponape (Etscheid).

These lists are naturally very incomplete and if Ponape appears to possess a much richer fauna than the rest of the islands, the reason is certainly not only its greater size and the higher altitude of its hills, but chiefly the fact that it has been better explored than the other atolls. I am convinced that even Ponape will still yield a number of additional species, when a thorough investigation of the hills has been made. My lamented friend Kubary had only just begun to collect in the higher regions when he died. It seems to me that it is too early yet to base geographical conclusions on the scant material now at our disposal. It will be useful, however, to give a comparative list of the species hitherto known from the three groups of Micronesia.

GENERA AND SUBGENERA.	MARIANNES.	PELEWS.	CAROLINES.
<i>Ennea</i>	<i>bicolor</i>		
<i>Concuplecta</i>		<i>pagodula</i>	
<i>Lamprocystis</i>	<i>misella</i> , ? <i>succinulata</i>	<i>palaënsis</i> , <i>wilsoni</i> , <i>margaritacea</i> , <i>straminea</i>	<i>palaënsis</i> , <i>frivola</i>
<i>Microcystina</i>	<i>denticulata</i>		
<i>Kaliella</i>	<i>doliolum</i>		<i>doliolum</i> , <i>tenuisculpta</i>
<i>Hemiplecta</i>			<i>sowerbyana</i>
<i>Trochomorpha</i>		<i>oleacina</i> , <i>electra</i> , ? <i>swainsoni</i>	<i>approximata</i> , <i>entomostoma</i> , <i>kuesteri</i> , <i>alta</i> , <i>nigritella</i>
<i>Flammulina</i>			<i>nigrescens</i>
<i>Charopa</i>	<i>fusca</i> , <i>rotula</i> , <i>quadrasi</i>		<i>ualanensis</i> , <i>kubaryi</i> , <i>ponapica</i>
<i>Endodonta</i>	<i>mariannarum</i> , <i>heptapychia</i>	<i>constricta</i> , <i>irregularis</i> , <i>lacerata</i> , <i>kororensis</i> , <i>fuscozonata</i>	<i>callizona</i>
<i>Eulota</i>			<i>micronesica</i>
<i>Chloraea</i>		? <i>pelawiana</i>	
<i>Pupisoma</i>			<i>philippinicum</i>
<i>Brazieria</i>			<i>velata</i>
<i>Partula</i>	<i>radiolata</i> , <i>gibba</i> , <i>bicolor</i> , <i>mastersi</i> , <i>fragilis</i> , <i>quadrasi</i>	<i>calypso</i> , <i>thetis</i> , <i>leucothoe</i>	<i>rufa</i>
<i>Vertigo</i> (<i>Ptychochilus</i>)	<i>quadrasi</i>		<i>capensis</i> , <i>ponapica</i>
<i>Leucochilus</i>	<i>pediculus</i>		<i>pediculus</i>
<i>Prosopaeas</i>			<i>carolinum</i>
<i>Opeas</i>	<i>gracile</i> , <i>tuckeri</i>		<i>gracile</i> , <i>tuckeri</i>
<i>Tornatellina</i> ,, (<i>Lamellina</i>) ,, (<i>Ochroderma</i>)	<i>quadrasi</i> <i>microstoma</i> <i>subcylindrica</i>		<i>ovatula</i> , <i>pusilla</i> <i>gigas</i>
<i>Geostilbia</i>	<i>philippinica</i>		
<i>Succinea</i>	<i>guamensis</i> , <i>quadrasi</i> , <i>piratarum</i>		<i>guamensis</i>

GENERA AND SUBGENERA.	MARIANNES.	PELEWS.	CAROLINES.
<i>Pythia</i>	<i>lecithostoma</i> , <i>pyramidata</i>		<i>acuta</i>
<i>Cassidula</i>		<i>philippinarum</i> , <i>quadrasi</i> , <i>compacta</i>	<i>philippinarum</i>
<i>Auricula</i>	<i>auricella</i>		
<i>Blauneria</i>	<i>gracilis</i>		
<i>Melampus</i>	<i>luteus</i> , <i>quadrasi</i> , <i>caffer</i> , <i>triticeus</i> , <i>fasciatus</i>		
<i>Pupina</i>		<i>difficilis</i>	<i>difficilis</i> , <i>brenchleyi</i> , <i>complanata</i>
<i>Palaina</i>	<i>taeniolata</i>	<i>alata</i> , <i>aurea</i> , <i>dimorpha</i> , <i>moussoni</i> , <i>patula</i> , <i>platycheilus</i> , <i>rubella</i> , <i>strigata</i> , <i>striolata</i> , <i>wilsoni</i>	<i>doliolum</i> , <i>kubaryi</i> , <i>ovatula</i>
„ (<i>Cylindropalaina</i>) „ (<i>Macropalaina</i>)		<i>pupa</i>	<i>scalarina</i> , <i>xiphidium</i>
<i>Hungerfordia</i>		<i>pelewensis</i>	
<i>Diplommatina</i> (<i>Pseudopalaina</i>)		<i>albata</i> , <i>crassilabris</i> , <i>gibboni</i> , <i>inflata</i> , <i>lamellata</i> , <i>lutea</i> , <i>polymorpha</i> , <i>pyramis</i> , <i>ringens</i>	
<i>Omphalotropis</i> (<i>Eurytropis</i>)	<i>bulimoides</i> , <i>elongatula</i> , <i>elegans</i> , <i>erosa</i> , <i>guamensis</i> , <i>platicosta</i> , <i>latilabris</i> , <i>ochtogyra</i> , <i>picta</i> , <i>quadrasi</i>	<i>catenata</i> , <i>cheynei</i> , <i>mutica</i> , <i>striatipila</i>	<i>bulimoides</i> , <i>carolinensis</i> , <i>coronata</i>
„ (<i>Stenotropis</i>)	<i>submaritima</i> , <i>suturalis</i>		<i>laevis</i> , ? <i>angulosa</i> , <i>tumidula</i>
„ (<i>Scalinella</i>)	<i>gracilis</i> , <i>pilosa</i> , <i>pilosella</i>		
„ (<i>Chalicopoma</i>)	<i>laevigata</i> , <i>semicostulata</i>		

GENERA AND SUBGENERA.	MARIANNES.	PELEWS.	CAROLINES.
<i>Acmella</i> (<i>Solenomphala</i>)	<i>conica</i>		
<i>Heteropoma</i>	<i>fulvum,</i> <i>glabratum,</i> <i>pyramis,</i> <i>quadrasi,</i> <i>tuberculatum,</i> <i>turritum</i>		
<i>Gonatorhaphe</i>			<i>incisa</i>
<i>Quadrasiella</i>	<i>clathrata,</i> <i>mucronata</i>		<i>ammonitella</i>
<i>Garrettia</i>			<i>carolinarum,</i> <i>solutum</i>
<i>Taheitia</i>	<i>alata,</i> <i>lamellicosta,</i> <i>parrula</i> <i>labiosa-robusta</i> <i>expansilabris</i>		
<i>Truncatella</i>	<i>mariannarum</i> <i>subauriculata,</i> <i>vitiana</i>		<i>pacifica</i>
<i>Helicina</i> (<i>Pleuropoma</i>) ,, (<i>Sulfurina</i>)			<i>humilis, zigzag,</i> <i>zonata,</i> <i>carolinarum</i>
<i>Georissa</i>	<i>elegans,</i> <i>biangulata,</i> <i>laevigata</i>		<i>rufula</i>

The Land Shells as enumerated above are distributed on the different islands as follows :

GENUS.	YAP.	RUK. (HOGOLU).	LUGUNOR. (MORTLOCK).	PONAPE.	UALAN.
<i>Lamprocyctis</i>	<i>palaënsis</i>	—	—	—	<i>frivola</i>
<i>Kaliella</i>	—	—	—	<i>doliolum</i>	—
"	—	—	—	<i>tonniscupula</i>	—
<i>Hemiplecta</i>	—	<i>soerbyana</i>	—	—	—
<i>Trochomorpha</i>	—	<i>eutomostoma</i>	—	<i>kuasteri</i>	—
"	—	—	—	" <i>transitans</i>	—
"	—	—	—	" <i>goniophthalma</i>	—
"	—	—	—	" <i>intermedia</i>	—
"	—	—	—	<i>alta</i>	—
"	—	—	—	<i>nigritella</i>	—
"	—	—	—	" <i>contigua</i>	—
<i>Planorbulina</i>	—	—	—	<i>nigrescens</i>	—
(<i>Charopæ</i>)	—	—	—	<i>kubaryi</i>	<i>ualanensis</i>
"	—	—	—	<i>ponapica</i>	—
<i>Eulodonta</i>	—	—	—	<i>callizona</i>	—
"	—	—	—	" <i>punctulata</i>	—
<i>Eulata</i>	—	—	—	" <i>micronesica</i>	—
<i>Papisona</i>	—	—	—	<i>philippinicum</i>	—
<i>Brachieria</i>	—	—	—	—	—
<i>Partula</i>	—	<i>velata</i>	<i>velata</i>	—	<i>rufa</i>
"	—	—	—	<i>rufa montana</i>	—
"	—	—	—	" <i>grandis</i>	—
<i>Vertigo</i>	<i>eapensis</i>	—	—	<i>ponapica</i>	—
<i>Leuochilus</i>	<i>pediculus</i>	<i>carolinum</i>	—	—	—
<i>Prosopæas</i>	—	—	—	<i>gracile</i>	—
<i>Opæas</i>	<i>gracile</i>	—	—	<i>tuckeri</i>	—
"	<i>tuckeri</i>	—	—	—	<i>pruinatum</i>
"	—	—	—	—	—

GENUS.	YAP.	RUK. (HOGOLU).	LUGUNOR. (MORTLOCK).	PONAPE.	ULAN.
<i>Thornatellina</i>	—	—	—	<i>ovoidula</i>	—
"	—	<i>gigas</i>	—	<i>pusilla</i>	—
"	—	—	—	—	—
<i>Succinea</i>	—	—	—	<i>quarantensis</i>	—
<i>Pylia</i>	—	<i>acuta</i>	—	<i>acuta</i>	—
<i>Cassidula</i>	—	—	—	<i>philippinorum</i>	—
<i>Palatina</i>	—	—	—	<i>doliolum</i>	—
"	—	—	—	<i>kubaryi</i>	—
"	—	—	—	<i>ovoidula</i>	—
"	—	—	—	<i>sealarina</i>	—
"	—	—	—	<i>xiphidium</i>	—
<i>Pupina</i>	<i>diplicilis</i>	—	—	<i>complanata</i>	—
<i>Omphalotropis</i>	<i>bulimoides</i>	<i>bulimoides</i>	<i>breuchlii</i>	—	—
"	<i>coronata</i>	—	<i>carolinensis</i>	—	—
"	—	—	—	<i>laevis</i>	<i>laevis</i>
"	—	—	—	<i>angulosa</i>	—
"	—	—	—	<i>tumidula</i>	—
"	—	—	—	<i>carolinarum</i>	—
<i>Garretia</i>	—	—	—	" <i>pyramis</i>	—
"	—	—	—	" <i>turrida</i>	—
"	—	—	—	<i>annuicollis</i>	—
<i>Quadrascella</i>	—	<i>incisa</i>	—	—	—
<i>Gonatorhaphis</i>	—	—	—	<i>pacifica</i>	<i>pacifica</i>
<i>Truncatella</i>	—	<i>humilis</i>	—	<i>humilis</i>	—
<i>Helicina</i>	—	—	—	<i>zigzag</i>	<i>zigzag</i>
"	—	—	—	—	<i>zonata</i>
"	—	—	—	<i>carolinarum</i>	—
<i>Granissa</i>	—	—	—	<i>rufula</i>	—

NOTES.

Note on Helicoid Land Shells from the Canary Islands.—Mr. Jules Mabile, in a paper on the Mollusca collected by Mr. Buchet in the Canary Islands¹, appears to have overlooked an article by the present writer.² Mr. Mabile states that *Hyalinia cellaria*, has hitherto only been found in Tenerife, Grand Canary, and Hierro, whereas I recorded this species as having been collected also in the island of Palma by Colonel Parry. *Hygromia multigranosa* is stated to have been collected in the living state by Mr. Buchet, the species having previously only been known in the sub-fossil condition. Colonel Parry, however, forestalled this discovery, as recorded by me in the introductory remarks to the same article.—G. K. GUDE.

Note on the Asiatic Species of Philomycus.—From an interesting letter recently received from Professor Cockerell we quote the following, with the writer's permission:—"Your treatment of the Asiatic *Philomycus* [see this Journal, p. 80], is very interesting, but not really conclusive for lack of material. . . The original *bilineatus* was from Chusan, nobody has ever seen the anatomy of it, and the only way to be sure of *bilineatus* is to dissect a Chusan example. Of course the Keferstein slug was *confusa*. I so stated in my paper. It is possible that the Japanese slug with ribless jaw (always?) is not distinct, but on the face of things one would suppose it to be a good species. Cannot you get leave to open the Chusan and Japanese examples in the British Museum? Also the Formosa one? I accept your view that *australis* is the Chinese slug very willingly, as it is virtually out of the question for it to be a native of the Sandwich Isles, and nothing is more natural than it should have been introduced from China."—T. D. A. COCKERELL.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

15TH (ANNUAL) MEETING, DECEMBER 8TH, 1899.

The President in the chair.

New member elected:—Mr. H. Overton.

The Annual Report of the Council and the Treasurer's Statement were read and adopted.

The Secretary reported that as no amendments had been received to the Council's nominations, the following would constitute the Council and Officers for 1900:—

President—WALTER E. COLLINGE.

Treasurer—H. HOWARD BLOOMER.

Secretary—GUY BREEDEN.

Other Members of Council—Messrs. H. WILLOUGHBY ELLIS, F. J. PART-
RIDGE, BROMLEY PEEBLES, and G. SHERRIFF TYE.

The President's Address was postponed until the February meeting.

EXHIBITS.

By the President: Specimens of *Onchidium tumidum*, Semp., and *Onchidina australis*, Semp., from Queensland, *Onchidiella reticulatum*, Semp., and *Onchidium dameli*, Semp., from Sydney, also *Onchidium ambiguum*, Semp., from Ponape.

By Mr. Bloomer: Shells of Indian and South Tasmanian species of *Cassia*.

¹ Bull. Soc. Philom. Paris, 1897 (8), ix, p. 91.

² Proc. Malac. Soc. Lond., 1896, ii, p. 15.

ANNUAL REPORT, 1899.

Your Council in presenting their Second Annual Report have to record a year's work of an exceedingly satisfactory character, and note with pleasure the continued steady progress of the Society.

During 1899 seven new ordinary and two honorary members have been elected. Your Council regret to have lost through continued ill-health an enthusiastic member, Mr. F. W. Carpenter.

During the year eight meetings have been held, at which five papers have been read. The exhibits have been numerous, and often more than could be dealt with at a single meeting.

The financial condition of the Society remains satisfactory.

Additions to the Library include some fifty pamphlets by various authors, presented by Professor H. A. Pilsbry and the President. It is hoped that all members will present copies of their writings to the Society's Library.

Your thanks are due to the President and Council of Mason University College and to Professor T. W. Bridge, for the facilities they have so kindly given in permitting our meetings to be held in the Zoological Department of the College.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. ii, vol. xii (pt. 48), pp. 178—258, pl. xlvii—lxiv.

After completing his survey of the genus *Liguus*, Dr. Pilsbry deals with the genus *Orthalius*, and proposes (p. 192) *Metorthalius* as a new sub-genus for *O. fraseri* and others. He then passes to the *Amphibulimina*, in which he admits as genera *Simpulopsis*, *Gwotis*, *Peltella* and *Amphibulina*. *Bulimulopsis* is proposed (p. 220) to replace *Eulioptus*, Albers non Hübner, as a sub-genus of *Simpulopsis*.

The following are described as new species: *Simpulopsis tryoni*, Brazil (p. 218); *Gwotis malleata*, Porto Rico (p. 230); *Amphibulina browni*, Dominica (p. 239).

This part concludes the study of the American *Bulimulida*, except a few toothed genera (e.g. *Odontostomus*) which, with the Australian and Oriental *Bulimulida*, are to be dealt with in the next volume.—E. R. SYKES.

Clarke, J. M.—The Naples Fauna (Fauna with *Manticoceras intumescens*) in Western New York. 16th Ann. Rpt. N.Y. State Geologist, 1898, pp. 31—165, pls. i—ix.

The Naples Fauna is the fauna which in the western part of the State of New York is associated with the Cephalopod *Goniatites intumescens*, Beyrich, a species usually regarded as characterizing a zone at the lower part of the Upper Devonian. According to the author this fauna presents affinities to the developments of the same zone as found in "Devon, Belgium, the Rhine, the Hartz, and on the west and east slopes of the Urals. In none of these; however, are its individual, specific and generic features so fully reproduced as in the association described by Holzapfel as occurring at Martenberg, near Adorf, in Westphalia."

This fauna occurs in the typical section of the formation known as the Portage Group, but as it differs considerably from the contemporaneous faunas of adjacent regions the author calls it the 'Naples Fauna,' and not the 'Portage Fauna,' a term which would include the fauna of the Portage sediments wherever found. The fauna, however, makes its first appearance in the Styliola limestone, which is found near the middle of the Genesee slates occurring immediately below the Portage group.

The portion of the fauna described in the present work includes the Goniatites, and the genera *Bactrites* and *Clymenia*, and in its description "an effort is made to elucidate the actual values of species of given or allied genera in a single fauna, and to express these values in terms of one another. . . . The purpose throughout has been less to seek phylogenic clues than to present ontogenic values." In each genus, therefore, the author describes very fully all the stages—embryonic, nepionic, neanic, ephelic and gerontic—of a typical species, and then compares the rest of the species of the genus with that species.

The Goniatites belong to the families *Primordialiidae*, *Prolecanitidae*, and *Magnosellaridae* of Hyatt. The greater number belong to the *Primordialiidae* and are referred to one genus for which the author uses Hyatt's name *Manticoceras*, and maintains that *Goniatites intumescens* must be regarded as its typical species. The name *Gephyroceras* is restricted to the discoidal, widely-umbilicated forms with a sulcated periphery which Hyatt placed in that genus; but in his revision of the Nautiloids and Ammonoids that appears in the English translation of Zittel's Text Book of Palaeontology we notice that Prof. Hyatt retains both *Manticoceras* and *Gephyroceras*, and that the figured example of *intumescens* is referred to the genus *Gephyroceras*; doubtless, however, that author will discuss these genera very fully in his forthcoming Monograph on Fossil Cephalopods. *Manticoceras pattersoni* being regarded as the "normal expression of the specific type" all its stages of growth are described in great detail, and the other species—mostly new—of the same genus are then compared with it. Some new species of *Gephyroceras*, as restricted by the author, are also described. The *Prolecanitidae* are represented by the genera *Beloceras*, *Sandbergeroceras* and a new genus *Probeloceras*, the type-species of which is *Goniatites lutheri*, Clarke. The forms belonging to the *Magnosellaridae* are referred to the genus *Tornoceras*, the type-species of which the author considers to be Conrad's *Goniatites uniaingularis*. While some authors have united Hyatt's genera *Tornoceras* and *Parodoceras*, Prof. Clarke considers them to be distinct. *Tornoceras uniaingularis* is described in great detail, the author's observations confirming Beecher's admirable account of the early stages of this species.

The *Bactritidae* include the genus *Bactrites*; the early stages of this genus were described by the author in 1894, but they are somewhat more fully described in the present work. We note also that the protoconch, which the author had previously described as belonging to the genus *Orthoceras*, is now somewhat doubtfully referred to that genus.

The *Clymeninae* are represented by one species belonging to the section of *Clymenia* for which Gümbel proposed the name *Cyrtoclymenia*.

We fully agree with the author's opinion that the Ammonoids of the Naples beds actually lived and died in these sediments, whilst the fauna of the Styliola limestone was transported from an adjoining province not yet known to us.

In conclusion, the author is to be heartily congratulated on his very careful description of this fauna which is so admirably illustrated on the nine lithographic plates accompanying the work.—GEO. C. CRICK.

Clarke, J. M.—Notes on the early stages of certain Goniatites. *Ibid.*, pp. 165—169, figs.

The author first describes "Some Points in the Development of *Anarcestes plebeiformis*, Hall, sp.," a rare and hitherto imperfectly known species found only at a single locality, Cox's Falls, near Charey Valley, N.Y., in a thin layer of limestone belonging to the epoch of the Marcellus Shales (lowest Middle Devonian). The general form of the shell, the character of the whorls, and the shape of the septa show that the species is a typical *Anarcestes*. The inner whorls are very rarely preserved. "Some etchings of the rock, have however, offered solid barite replacements of the inner whorls," and upon these the author has based his observations. The protoconch is very large, transversely elongate or obtusely

fusiform in shape, and ornamented with distinct transverse lines almost to its distal surface. The transverse ornaments do not exhibit any trace of the hyponomic sinus, or backwardly directed curve in the centre of the periphery, until near the end of the third whorl. The nepionic shell is in contact with the protoconch, whereas in some species of *Anarestes* that have been described the nepionic shell is free for about half a whorl. The author gives figures of the protoconch, and of the nepionic shell, and a drawing of the suture-line of the seventh volution, the precise form of the earliest suture-lines not having been made out. He concludes that the immense size of the protoconch when compared with that of other ammonoids indicates a closer approach to the stock whence the *Goniatitinae* have been derived.

He then describes and figures the protoconch of the species which was first described by Vanuxem as *Goniatites expansus*, and afterwards by Hall as *Goniatites vanuxemi*, Vanuxem's name being pre-occupied. This species is a typical form of the genus which was named by Meek *Agoniatites* and by Mojsisovics *Aphyllites*. The protoconch, although large, is less than that of *Anarestes plebeiformis*; it is "rather stoutly ellipsoidal, projecting a little at each side beyond the edge of the first whorl," and its "surface is finely and sharply striated horizontally from the distal extremity"; it is in complete contact with the nepionic whorl. In the example which the author has figured (on an enlarged scale) a portion of the striated test is broken away and shows the long and distinct scar of the siphonal cæcum.

Finally, the author figures a vertical section of the first three chambers of the Cretaceous species *Nautilus (Eutrephoceras) Dckayi*, Morton, showing the continuous but irregularly curved course of the "siphon."—GEO. C. CRICK.

Kennard, A. S., and Woodward, B. B.—Notes on *Paludestrina jenkinsi* (Smith) and *P. confusa* (Frauenf.). Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 297—300.

The authors have had specimens of *P. jenkinsi* compared with two shells in the Jeffreys' Collection labelled "*Hydrobia ferrusina*, Hampshire, Sowerby," with which they agree in every respect. *P. confusa*, Frauenf., for which a number of localities are given, was last collected by the writers in 1895, but owing to extensive building and draining operations, it no longer exists in any of these, and they conclude that it must now be considered extinct in England.—W. E. C.

Gude, G. K.—Armature of Helicoid Landshells. Sci. Goss., 1899, vol. vi, pp. 75—77, 147—149, 174—177, figs. 100—105, and map.

The species treated of are *P. caliginosa*, Sykes, *P. clathratula v. compressa*, Sykes, and *P. francoisi*, H. Fisch. A very useful synopsis of the genus is given, notes on the geographical distribution and a key to the species. This series of papers is brought to a termination and an index given to those previously published.—W. E. C.

Hedley, Charles.—The Mollusca of Funafuti. (Supplement.) Mem. Aust. Mus., 1899, vol. iii, pt. 9, pp. 549—565, figs. 59—80.

The author records in this appendix the mollusca obtained on the second and third expedition to the Atoll of Funafuti. In all 56 species are enumerated, of which 16 are new. A new genus (*Mecoliotia*) of the *Liottiidae* is also described.—W. E. C.

Walker, Bryant.—The Terrestrial Mollusca of Michigan. 8vo., pp. 27, 1 map. Detroit, Mich.: 1899.

This is a very carefully prepared annotated catalogue and particular attention has been devoted to the authentication of the various species, of which 75 are enumerated. Since the issue of a similar catalogue in 1895, *Polygyra clausa*, Say, has been authenticated, while *Omphalina inornata*, Say, *Zonitoides limatulus*, Ward, and *Succinea aurea*, Lea, are shown to be doubtful or have been cited in

error, as well as the two following varieties: *Polygyra thyroides*, Say, v. *bucculenta*, Gld., *P. palliata*, Say, v. *alba*, Currier. The following six species and two varieties are additions to the fauna: *Strobilops affinis*, Pils., *Vitrea wheatleyi*, Bld., *Gastrodonta intertexta*, Binn., *G. demissa*, Binn., *Agriolimnax agrestis*, L., *Polygyra albolabris*, Say, v. *minor*, Sterki, *Conulus fulvus*, Müll. v. *mortoni*, Jeffr., *C. chersinus* v. *polygyratus*, Pils.

Many interesting notes are given on the distribution.—W. E. C.

Suter, Henry.—Descriptions of a new Variety and five new species of New Zealand Land Mollusca. Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 286—291, pl. xv.

Mr. Suter here describes and figures the following: *Endodonta* (*Charopa*) *otagoensis*, and *subinflecta*, *Flammulina* (*Pyrrha*) *virescens*, *F.* (*Phacussa*) *fulminata*, Hutt., var. *costata*, *F.* (*P.*) *henryi* and *Paryphanta edwardi*. Figures of the terminal ducts of the generative organs of *F. virescens* and *F. henryi* are given in addition to figures of the shells, jaw, and radula.—W. E. C.

Suter, Henry.—Anatomical notes on *Medyla inculpta* (Pfr.). Ibid., pp. 530—532, figs. i—iv.

From an examination of the generative organs, jaw and radula of this species, the author finds that it is closely related to *Sitala anthropophagorum*, and is of opinion that its proper place is in the genus *Medyla*, Albers, sect. *Euplecta*, Semper.—W. E. C.

Suter, Henry.—New Zealand *Polyplacophora*: Keys to Genera and Species. Trans. N.Z. Inst., 1899, vol. xxxi, pp. 59—64.

Suter, Henry.—Revision of the New Zealand *Pleurotomidae*, with descriptions of Six new Species. Ibid., pp. 64—77, pl. iii.

Mr. Suter's synopsis of the New Zealand Polyplacophora will prove very useful, as also his revised classification of the New Zealand *Pleurotomidae*. This latter, being based entirely upon the characters of the shells, is, as the author states, open to amendment. Twenty-six species are enumerated, of which the following are new: *Surcula verrucosa*, *Mangilia subaustralis*, *M. flexicostata*, *Clathurella subabnormis*, *C. nodicincta*, and *Daphnella substriata*. Figures are given of the new species. In all cases the location of the type is given and the reference to the original description and figures.—W. E. C.

Harris, G. D.—The Lignitic Stage. Pt. ii. Scaphopoda, Gastropoda, Pteropoda, and Cephalopoda. Bull. Amer. Paleont., Ithaca, N.Y., 1899, pp. 1—128, pls. 1—12.

This paper fully maintains the high standard set up in part I. Twenty-seven new species and five new varieties are described and figured, and many valuable critical notes are given on the various species dealt with. Not a few paleontologists will differ from the author in uniting *Athleta tuomeyi*, Conrad, with *Volutilithes petrosus*, Conrad: even supposing there are not sufficient characters of importance to warrant sub-generic distinction, the specific characters are very pronounced, on the other hand *Syrnola insignifica*, Ald., is very rightly regarded as synonymous with *S. trapaquara*, Har., which species seems very different from Cossmann's *propeacacula*.

Of the new species, *Levifusus indentus* is an interesting form somewhat approaching forms of *L. pagoda*, Heip., but very properly separated from that species. No doubt future work will bring to light other forms of this new species which will, we think, further separate it from *L. pagoda*, and clearly mark it off from any of the many varieties of *Fulgur spiniger*.

Not the least valuable part of Mr. Harris' work is to be found in the careful reproduction of the original descriptions of the various species enumerated.—W. E. C.

GENERAL REVIEWS.

A Manual of Zoology.—By the late T. Jeffery Parker and William A. Haswell. 8 vo., pp. xvi + 550, and 300 figs. London: 1899, Macmillan & Co., Ltd.

This manual forms an admirable introduction to zoology for a class of students who deserve something more than the modern cram book. Owing to the restrictions of space many "groups of rare occurrence and uncertain relationships" have been wisely omitted and greater space devoted to the more familiar forms. In cases of this kind it is always difficult to decide just what to omit and what not, and the authors here seem to have been very happy in their selection. The Brachiopoda might perhaps have received a little more attention.

We note with pleasure that in the author's opinion laboratory and museum work should be supplemented by work in the field and on the seashore.

The types are all well chosen and excellently illustrated, particularly the Coelenterata. Amongst so many modern illustrations it seems a pity to include such figures as fig. 170 (a proglottis of *Tenia*), and fig. 81 (Starfish, vertical section of an arm).

Chapter xi dealing with the Mollusca is well written, and there are some very useful figures illustrating the anatomy of the Cephalopoda.

We heartily welcome this work, which must prove of great value to junior students.—W. E. C.

Statistical Methods with special reference to Biological Variation.—By C. B. Davenport. 16 mo., pp. vii + 148, and 28 figs. New York: 1899, John Wiley & Sons.

This work is intended for those who are interested in the quantitative study of species and of organic variation, and must prove very useful to all biologists engaged in such work. It is clearly and concisely written and remarkably free from errors. The method of using the various tables is carefully explained and fully illustrated. All who are interested in the methods elaborated by Galton and Pearson will welcome Dr. Davenport's handbook.—W. E. C.

EDITOR'S NOTES.

It is with feelings of great pleasure that we have to record the receipt of 50 francs from a "French malacologist" towards the deficit on the Journal during 1899. We take this, our only means, of tendering our sincere thanks to the donor for his generous gift and good wishes.

We cannot refrain from quoting a short paragraph from the letter accompanying the above donation "If," says the writer, "English students of the Mollusca were less shell-collectors and more malacologists your journal would have a balance not a deficit."

We regret to have to record the deaths of Edgar Leopold Layard on January 1st, 1900, in his seventy-fifth year, and G. Sherriff Tye on February 4th, 1900. A portrait and notice of the latter will appear in our next number.

We have received from Mr. H. B. Preston his price lists of South African Marine and Land and Freshwater Shells, also Australian L. and F. Shells. Mr. Walter F. Webb (Albion, N.Y., U.S.A.) sends us a very useful and carefully prepared priced check-list of Land Shells of the United States and Canada.

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VOL. VII.

DESCRIPTION OF A NEW SPECIES OF ANADENUS FROM CHINA.

BY WALTER E. COLLINGE,

Mason University College, Birmingham.

(Plate vi.)

SOME short time ago M. Ph. Dautzenberg very kindly sent me four examples of a species of slug, collected at Qua Toun, Fo Kien, China, which on examination I find belong to the genus *Anadenus*, Heyn. There are two immature specimens and two which appear to be adult. It is interesting to find that this genus is distributed much further eastward than was generally supposed¹. Last year I described² a very handsome species from Sechuen, and Dr. Möllendorff³ has more recently described another species from the same province⁴.

To M. Dautzenberg I wish to express my best thanks for these interesting molluscs, with which I have much pleasure in associating his name, and to the Council of the Birmingham Natural History and Philosophical Society for defraying the artist's charges.

¹ Cockerell, Proc. Zool. Soc., 1891, p. 221.

² Journ. of Malac., 1899, vol. vii, p. 78.

³ Ann. Mus. Zool. l'Acad. Imp. d. Sci. St. Petersb., 1899, p. 4.

⁴ Dr. Möllendorff wrote me expressing the opinion that possibly his species (*A. sinensis*) might be identical with the one I described, viz., *A. sechuenensis*. Since the above was written he has very kindly favoured me with an opportunity of examining the type of *A. sinensis*, and from an external examination I am of opinion that it is a distinct species.

Anadenus dautzenbergi, n. sp. Pl. vi., figs. 1—8.

Animal (Pl. vi, figs. 1—3) yellowish-grey, with a yellowish-brown dorsum, which is bounded laterally by a dark line, with short, lateral branches. Head yellowish. Mantle almost circular, reddish-brown, with irregular, brownish-black mottling. Respiratory orifice slightly behind the middle of the mantle. Generative orifice below, and some little distance behind, the right lower tentacle. Rugæ small, irregular in outline, in somewhat diamond shaped groups, divided by deep black sulci. Peripodial groove small but distinct. Foot-fringe same colour as the body, excepting in the tail region, where it is similar to the ground colour of the mantle; lineoles nearly black. Foot-sole shows ill defined median and lateral planes, of a brownish-yellow colour, median plane faintly marked by transverse wrinkles.

Length (in alcohol) 37·5 mm.; length of mantle 14·5 mm.; breadth of foot-sole 11·5 mm.

Shell (Pl. vi, figs. 4a, 4b), almost circular, thick, convex above, concave below, apical portion well defined, faint excentric lines of growth. Ventrally there is a thick, lip-like infolding.

Maj. diam. 5 mm., min. diam. 4·9 mm.

Hab.—Qua Toun, mountains (3,500 ft.) due S.E., Fo Kien, China. *Type* in my collection.

ANATOMY.

The Jaw (Pl. vi, fig. 5) is arcuate and consists of twenty-one, partly unequal, separate, vertical lamellæ, each bearing closely set transverse striæ. In *A. altivagus*, Theob., and *A. sechuenensis*, Collge., the vertical lamellæ average ten in number, and they are about twice the breadth of those in this species.

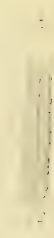
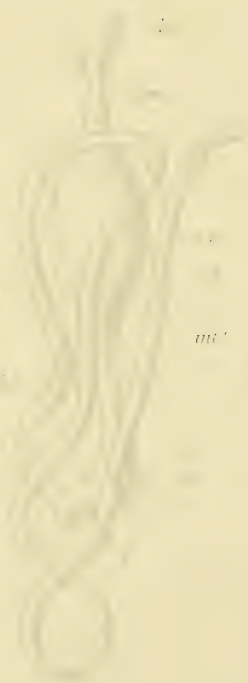
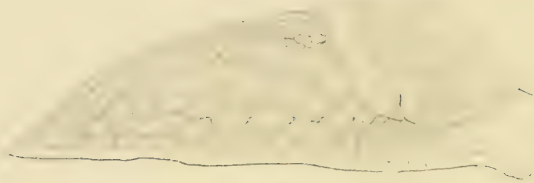
The Radula agrees very closely with that figured by Pilsbry¹ for *A. altivagus*, excepting that here the mesocones are shorter and blunter.

The Alimentary System (Pl. vi, figs. 6, 7).—This is much simpler than in either *A. altivagus*, Theob., or *A. sechuenensis*, Collge. It reminds one somewhat of the condition which is found in the American genus *Anadenulus*, Ckll.,² which seems to form an intermediate stage between *Anadenus*, Heyn., and *Prophysaon*, Bld. and Binn. (cf. Pilsbry, *op. cit.* pl. xi, figs. 32, 35).

The buccal cavity is slightly produced backwards, and measures 9·5 mm. in length, from the dorsal side there is a short œsophagus

¹ Proc. Malac. Soc. Lond., 1898, vol. iii, p. 96, pl. vii, fig. 7.

² Proc. Acad. Nat. Sci. Phila., 1898, p. 254.



leading into a short, wide crop, which, with the narrow tube-like portion immediately beyond, forms the first loop of the intestinal tract. Posterior to this is the bilobed stomach which is situated on the right side of the "liver." The second loop of the intestine passes to the left side, slightly ventrally, and proceeding forwards makes a turn to the right, at the anterior end of the crop; passing backwards again on the left side, as loop number three, it becomes sharply folded upon itself, forming loop four, which, as the rectum, leads to the anus.

It will be noticed that loops 3, 4 and 5 all lie dorsally to the crop and stomach, excepting the sharp folded portion at the junction of loops 3 and 4.

Pedal Gland (Pl. vi, fig. 8).—This is a small lobulated organ, 10 mm. in length. The figure sufficiently explains the general appearance.

The Generative Organs.—Owing to some unknown cause these were not in a fit condition either to dissect or figure, the different parts broke away as lifted by the forceps, or even when moved with a needle. The penis and free oviduct were in a slightly better condition but still unsatisfactory. Had I been able to figure and describe the whole of the generative system, I expect they would have shown some striking differences from those in the two above mentioned species of *Anadenus*. If this had been so, I should not have hesitated to place *A. dautzenbergi* in either a new genus or subgenus. In quite a number of characters it differs considerably from *Anadenus*, as at present known, particularly in the form and disposition of the alimentary canal, the shell, jaw, and pedal gland.

EXPLANATION OF PLATE VI.

Anadenus dautzenbergi, n. sp.

- Fig. 1. View from the right side. $\times 2$.
 Fig. 2. Dorsal view. $\times 2$.
 Fig. 3. Rugæ enlarged.
 Fig. 4. Shell. *a* Viewed from above, *b*. Viewed from below. $\times 4.5$.
 Fig. 5. Jaw. $\times 8$.
 Fig. 6. Lateral view of the buccal cavity.
 Fig. 7. Alimentary Canal.
 Fig. 8. Pedal Gland. $\times 2$.

REFERENCE LETTERS.

<i>b.c.</i>	Buccal cavity.	<i>r.</i>	Rectum.
<i>cr.</i>	Crop.	<i>r.m.</i>	Retractor muscle
<i>int. 1-4.</i>	Intestine.	<i>s.d.</i>	Duct of salivary gland.
<i>oc.</i>	Cesophagus.	<i>st.</i>	Stomach.

ON SOME MALFORMED SPECIMENS OF *ANODONTA CYGNEA*, L.

By H. H. BLOOMER.

(Plate vii.)

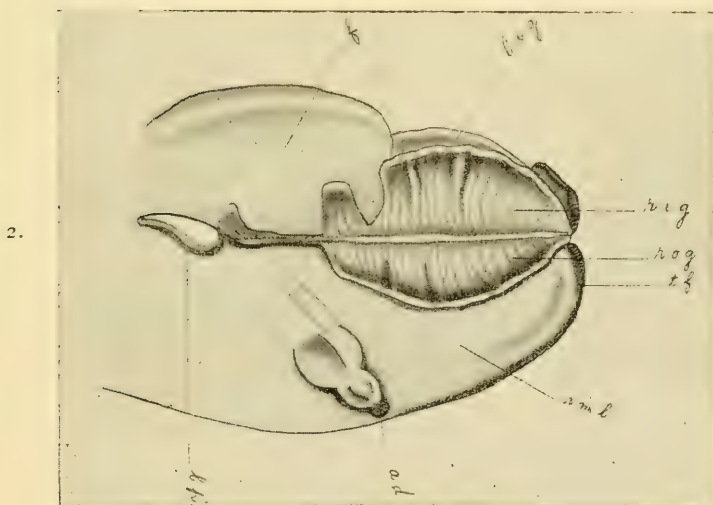
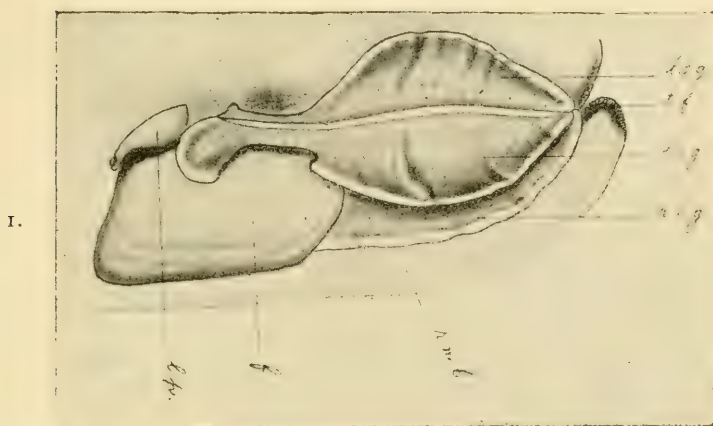
In the number of cases recording malformations of the shells of the *Unionidae*, I have been unable to trace any account of the effect, if any, these have had upon the soft parts of the animal. It may, therefore, be of interest to give the results of the examination of three specimens of *Anodonta cygnea*, collected by Mr. S. P. Bolton from Bracebridge Pool, Sutton Coldfield.

For convenience sake these specimens will be referred to as A. B. and C. respectively. Specimen A was collected in February last. The left valve (Pl. vii, fig. A1.) of the shell shows the scars of two fractures. The first commencing below the umbo, proceeds in a transverse direction, but is only of a slight nature; the second, which is nearly in the centre of the valve, is situated posterior to the first one, and pursues a course converging upon it. It was from this second fracture, which not only destroyed a portion of the shell, but also lacerated the left mantle-lobe, that the malformation arose. Evidently the tendency of the mantle-lobe was then to form the valve in a semicircular direction, while the posterior portion followed a normal course. This apparent attempt to maintain a continuous growth in two gradually diverging directions, resulted in the overlapping or folding of the two adjacent parts of the valve. This folding continued, and in all probability eventually caused the posterior portion of the mantle-lobe to turn inwards, by which means a curious in-growth of the shell was formed (Pl. vii, fig. A2.). The mantle-lobe when examined covered the whole of the inner side of the valve and was much thicker near the line of fracture. There was also a lateral process of the mantle, arising from the outer side, which filled the anterior part of the cavity produced by the overlapping mentioned above.

The right valve also shows an abnormal growth, with a slight inclination to follow a similar course, but does not exhibit any sign of having been fractured.

In addition to the laceration of the mantle-lobe, which the animal was able to renew, the left pair of gills were permanently injured (fig. 1). The inhalent and exhalent canals are somewhat constricted

along these injured portions, otherwise the remaining parts of the viscera are normal.



Anodonta cygnea, L.

Fig. 1.—View of part of the animal of specimen A.

Fig. 2.—View of part of the animal of specimen B.

a. d. thickened growth and tentacular fringe of mantle-lobe. f. foot. l. i. g. left inner gill. l. o. g. left outer gill. l. p. labial palp. r. m. l. right mantle-lobe. r. i. g. right inner gill. t. f. tentacular fringe.

Specimen B was collected in March and exhibits only a slight indentation across nearly the whole of both valves. Both of the gills on the right side are deformed, and the outer gill of the left side (fig. 2). The mantle-lobes are complete, but the left one shows a thickened growth on the inner side. Commencing near the median line and close to the base of the gills, it continues in a slightly postero-ventral direction towards the edge; as it proceeds it narrows and increases in thickness until near its termination, where it becomes circular, is deeply pigmented, and has a well developed tentacular fringe, differing only in size from that bordering the inhalent aperture of the branchial chamber (fig. 2. *a. d.*).

Specimen C (Pl. vii, figs. B1, B2) was collected about three years ago. Though not exhibiting any signs of fracture it is a very deformed shell, and when viewed from the end the valves are seen to be greatly contorted. The left valve is deeply indented, but the lines of growth are normal. The right valve shows a transverse malformation and externally has two parts with semicircular lines of growth, which later have assumed a normal course, while on the inside there are two inverted cup-like growths.

The contorted form of the shell has given rise to great deformity in the animal; thus the larger portion of the viscera was in the anterior portion of the left valve, which gave rise to a displacement of the pericardium, heart, and rectum. The outer gills of both sides were deformed, and the foot was enlarged and forced into a more anterior position than is usual. The left mantle-lobe was penetrated by the shell.

The results of the examination of these three interesting specimens tend to point to the following facts:

- a.* that the animal is able to repair even extensive damage to the mantle-lobes, but is not able to make good injuries to the gills.
- b.* the gills are the first organs to be affected.
- c.* the animal is capable of living and thriving with very much aborted respiratory organs, and with considerable displacement of the various internal organs.

EXPLANATION OF PLATE VII.

Anodonta cygnea, L.

Fig. A1. Left valve of shell of specimen A.

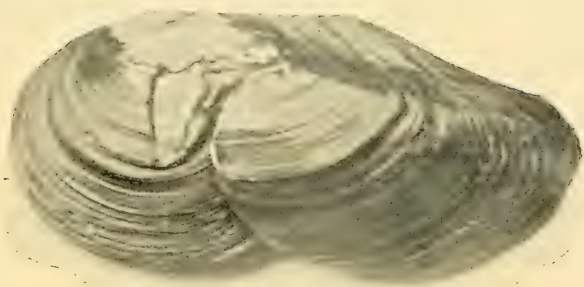
Fig. A2. Inner side of same.

Fig. B1. Right valve of specimen C.

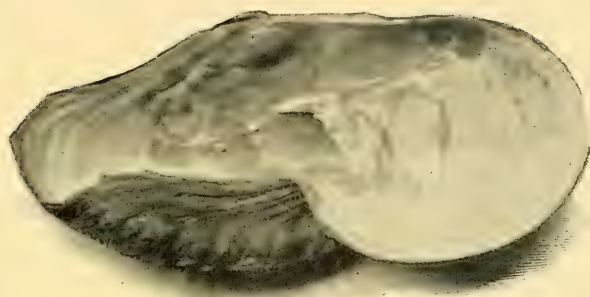
Fig. B2. Left valve of same.

All the figures are reduced one third.

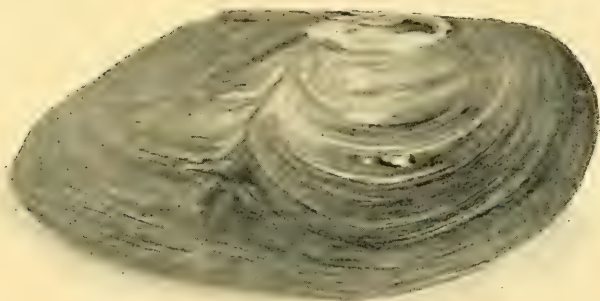
A1.



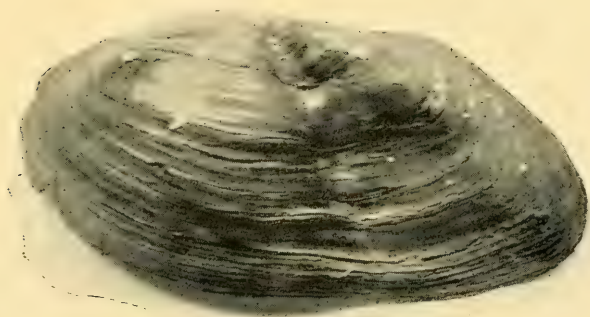
A2.



B1.



B2.



ANODONTA CYGNEA, L.

NOTES ON THE GENUS SESARA, ALB., WITH DESCRIPTIONS OF TWO NEW FORMS.

By G. K. GUDE, F.Z.S.,

London.

Sesara harmeri, n. sp. Figs. 1, 2.

Shell subperforate, conical, thin, pellucid, pale corneous, finely striulate, decussated by microscopic spiral lines. Spire conoidal; suture linear, margined; apex obtuse. Whorls 7, increasing slowly, slightly convex, with an acute, compressed keel; the last whorl descending very shortly in front; base flattened, a little tumid towards the umbilicus. Aperture oblique, trapezoid. Peristome white, margins distant; right margin a little expanded: basal margin slightly thickened, horizontal; columellar margin shortly reflected over the narrow perforation of the umbilicus. Within the aperture are two teeth, one on the columellar margin, conical; the other on the basal margin, curved, triangular, its apex curved towards the umbilicus.

Diam. maj. 6·75, min. 6·25, alt. 5 mm. Eight specimens.

Hab.—Khasi Hills, Assam. *Type* in my collection.



Figs. 1 and 2.—*Sesara harmeri*, n. sp.

Figs. 3 and 4.—*Sesara diploton*, Benson.

From *Sesara diploton*, its nearest ally, this new species differs in the more elevated spire, the more flattened base, and the narrower perforation of the umbilicus. In *S. diploton* the base near the mouth slopes more decidedly towards the umbilicus, and the elongated scrobiculation behind the mouth, so conspicuous in that species, is absent in *S. harmeri*. The basal tooth, moreover, is simple, while in *S. diploton* it is double and sinuate, the anterior tooth in *S. diploton*

has the apex curved towards the periphery, and the posterior one towards the umbilicus: the basal margin instead of being horizontal as in *S. harmeri*, descends obliquely and forms an obtuse angle with the columellar margin. *S. harmeri* is further separated from *S. diplodon* in having the keel more acute and compressed: and finally the last whorl of the latter shell is not deflected in front.

S. diplodon (figs 3, 4) was described by Benson in 1859¹. As the double nature of the tooth on the basal margin is *not* mentioned in the original description, I was at first uncertain which of the two forms to refer to Benson's species. Mr. Harmer, however, obligingly forwarded to me for inspection the three type specimens from the Cambridge Museum of Zoology, and although these are not mature—a trace of a tooth, being shown only by one specimen—the distinctive character of the base of the shell leaves no doubt that the form with the double basal tooth is Benson's species. That the difference in the character of the teeth of the two species, and the scrobiculation of *S. diplodon*, are not dependent on age is amply demonstrated by my examination of immature specimens of both in my collection.

Twelve specimens of *S. diplodon*, together with the new species, were received from a native collector, these former measure:

Diam. 8·5, alt. 6 mm. Diam. 7, alt. 5 mm. Diam. 6, alt. 4·5 mm.

S. diplodon is known to be of fairly wide distribution. Mr. Nevill² having recorded the following habitats: Preparis Island, Little Cocos Island, Thyet Myo, Ponsee and Bharno, Arakan Hills, Naga Hills, Sylhet, Chittagong, Khasi Hills, Dacca Hills.

***Sesara harmeri* v. *anodonta*, n. var. Figs. 5, 6.**

In this variety, which to some extent connects the two fore-mentioned species, the spiral lines are more distinct, and the base broader than in the type. There are no teeth in the aperture.

Diam. maj. 8·5, minor 7·75, alt. 6 mm. One specimen.

Hab.—That of the type.



Figs. 5 and 6.—*Sesara harmeri* v. *anodonta*, n. var.

As the species and varieties of *Sesara* have not hitherto been

¹ Ann. and Mag. N. H., 1859 (ser. 3), vol. iii, p. 187.

² Hand-List Moll. Ind. Mus. Calcutta, 1878, i, p. 53.

arranged, it has occurred to me that a synopsis, with bibliographical references, may be useful; and for convenient identification I have added a key.

- 1.—*S. episema*, Pons., Proc. Mal. Soc., 1894, i, p. 56, *cum icon.*
Khasi Hills.
- 2.—*S. infrendens*, Gould, Journ. N. H. Soc., Boston, 1844, iv, p. 453, pl. 24, f. 6.—Pfeiffer, Mon. Helic., 1848, i, p. 152.—Reeve, Conch. Icon., 1852, pl. 128, f. 770.—Conch. Ind., 1870, pl. 15, f. 2.—Stoliczka, Journ. Asiat. Soc., Bengal, 1871, xl, p. 244.—Conch. Cab., (2), ii, p. 187, t. 99, figs. 1—3.—Tryon, Man. Conch., 1889 (2), ii, p. 132, pl. 43, figs. 39—41.
Tavoy.
- 3.—*S. infrendens* var. *capessens*, Bens., Ann. and Mag. N. H., 1856 (2), xviii, p. 250.—Pfeiffer, Mon. Helic., 1859, iv, p. 194.—Novit. Conch., 1860, i, p. 133, t. 36, f. 17—20.—Conch. Ind., 1870, pl. 60, f. 5.—Tryon, Man. Conch., 1886, (2), ii, p. 132, pl. 44, figs. 58—60.
Moulmain.
- 4.—*S. infrendens* var. *tickelli*, Theobald, Journ. Asiat. Soc., Bengal, 1859, xxviii, p. 306.—Pfeiffer, Mon. Helic., 1868, v, p. 267.—Conch. Ind., 1870, pl. 15, f. 3.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 44, f. 51.
Moulmain.
- 5.—*S. pylaica*, Bens., Ann. and Mag. N. H., 1856 (2), xviii, p. 249.—Pfeiffer, Mon. Helic., 1859, iv, p. 164.—Conch. Ind., 1870, pl. 15, f. 2.—Stol., Journ. Asiat. Soc., Bengal, 1871, xl, p. 245.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 43, f. 44.
Moulmain.
- 6.—*S. ataranensis*, Theob., Jour. Asiat. Soc., Bengal, 1870, xxxix, p. 401, pl. 18, f. 7.—Conch. Ind., 1872, pl. 84, figs. 5, 6.—Pfeiffer, Mon. Helic., 1876, vii, p. 578.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 44, figs. 54, 55.
Ataran Valley, Prov. Martaban.
- 7.—*S. hungerfordiana*, Theob., Journ. Asiat. Soc., Bengal, 1876, xlv, p. 184, pl. 14, f. i.—Tryon, Man. Conch., 1886 (2), ii, p. 133, pl. 44, figs. 63, 64.
Salween Valley, Prov. Martaban.
- 8.—*S. inermis*, Theob., Journ. Asiat. Soc., Bengal, 1876, xlv, p. 184, pl. 14, figs. 2.—Tryon, Man. Conch., 1886 (2), ii, p. 133, pl. 44, figs. 56, 57.
Moulmain.
- 9.—*S. ingrami*, W. T. Blanf., Conch. Ind., 1870, pl. 60, figs. 9, 10.—Journ. Asiat. Soc., Bengal, 1880, xlix, p. 193.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, figs. 62, 63.
Pegu.

- 10.—*S. diploilon*, Bens., Ann. and Mag. N. H., 1859 (3), iii, p. 187.—Pfeiffer, Mon. Helic., 1868, v, p. 256.—Conch. Ind., 1870, pl. 60, f. 8.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, f. 61.—Morlet, Journ. de Conchyl., 1891, p. 232. *Supra* p. 139, figs. 3, 4. Preparis Island; Little Cocos Island; Thyet Myo; Ponsee and Bharno; Arakan Hills; Naga Hills; Sythet; Chittagong; Daffa Hills; Teria Ghat; Khasi Hills; Mount Soutem, West Laos.
- 11.—*S. harmeri*, *supra* p. 139, figs. 1, 2. Khasi Hills.
- 12.—*S. harmeri* var. *anodonta*, *supra* p. 140, figs. 5, 6.
- 13.—*S. galea*, Bens., Ann. and Mag. N. H., 1859 (3), iii, p. 388.—Pfeiffer, Mon. Helic., 1868, v, p. 264.—Conch. Ind., 1870, pl. 54, f. 7.—Tryon, Man. Conch., 1887 (2), iii, p. 75, pl. 14, f. 4. Teria Ghat, Khasi Hills; Naga Hills.
- 14.—*S. bidenticulata*, Bens., Ann. and Mag. N. H., 1852 (2), ix, p. 405.—Pfeiffer, Mon. Helic., 1853, iii, p. 165.—Reeve, Conch. Icon., 1853, pl. 174, f. 1184.—Conch. Ind., 1870, pl. 60, f. 6.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, f. 59. Nilgherries.
- 15.—*S. pirricana*, Pfeiffer, Proc. Zool. Soc., 1854, p. 55.—Reeve, Conch. Icon., 1854, pl. 191, f. 1341.—Pfeiffer, Mon. Helic., 1859, iv, p. 154.—Conch. Ind., 1872, pl. 87, figs. 5, 6.—Tryon, Man. Conch., 1887 (2), iii, p. 68, pl. 13, f. 58. Walaghat, Koondah Mountains, near Calicut.
- 16.—*S. daghoba*, W. T. Blanford, Journ. Asiat. Soc., Bengal, 1861, xxx, p. 356, pl. 2, f. 2.—Pfeiffer, Mon. Helic., 1868, v, p. 219.—Conch. Ind., 1875, pl. 150, f. 10.—Tryon, Man. Conch., 1887 (2) iii, p. 69, pl. 13, f. 60. Patchamullies and Kalryenmullies Mountains, India.

KEY TO SPECIES AND VARIETIES.

A. Aperture without palatal teeth.

- a. With one transverse parietal plate. *pylaica*.
- b. Without parietal plate.
- a. Shell depressed; diam. 11.5, alt. 4.75 mm. *inermis*.
- β. Shell conoid; last whorl deflexed in front; diam. 8.5, alt. 7.75 mm. *anodonta*.
- γ. Shell conoid; last whorl not deflexed in front; diam. 9, alt. 5.5 mm. *galea*.

- B. Aperture with *one* conical palatal tooth on basal margin. *episema*.
- C. Aperture with *two* palatal teeth.
- a. Teeth deeply seated: outer conical transverse, inner horse-shoe-shaped. *ataranensis*.
- b. Teeth on peristome,
- a. One on basal, one on columellar margin.
*Basal margin horizontal; base of shell flattened. *harmeri*.
**Basal margin descending, rounded; base of shell convex. *pirrieana*.
- β. Both teeth on basal margin.
*Shell 6 mm. diam. *daghoba*.
**Shell 3 mm. diam. *bidenticulata*.
- D. Aperture with *three* palatal teeth; one on columellar margin, two on basal margin.
- a. Teeth conical in a transverse row.
- a. All on peristome.
*Two on basal margin close together. *infrendens*.
**Two on basal margin almost united. *tickelli*.
***Three teeth sub-equal, equidistant. *capessens*.
- β. Inner tooth on peristome horizontal; outer two a little more deeply seated; middle one oblique, outer transverse. *hungerfordiana*.
- b. Two teeth on basal margin behind one another.
- a. Both horizontal. *dipledon*.
β. Anterior tooth horizontal, posterior one transverse. *ingrami*.

DESCRIPTION OF A NEW VARIETY OF ISOMERIA SUBCASTANEA, PFR.

By G. K. GUDE, F.Z.S.

***Isomeria subcastanea* v. *kobeltiana*, n. var. Figs. 1, 2.**

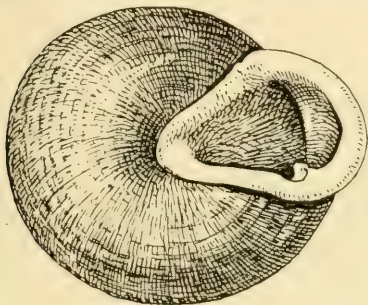
DIFFERS from the type in being larger and of lighter colour; the whorls are less convex above, and the last is not inflated below, behind the peristome; the base is less distinctly ribbed; the greater portion of the lower surface and a narrow zone above the periphery, are distinctly malleated in concentric rings, a character totally absent in the type. The principal differences, however, lie in the peristome and its teeth; in the variety the peristome is strongly thickened and broadly expanded, its basal margin is flattened, and its columellar margin, which is almost straight, completely covers the umbilicus; these margins are subparallel and are united by a thick white callus on the parietal wall. The outer tooth is not raised and there is only one slight depression behind the peristome, corresponding to the outer tooth; to the left there is also a strong tooth sloping gently towards the columellar margin. In the type, on the other hand, the peristome is less thickened and expanded but more reflexed; the basal margin is deeply sinuous, the columellar margin convex at first, then concave, and only partially reflected over the umbilicus; there is only one tooth which is raised on an eminence, with a corresponding scrobiculation behind the peristome; there is no second tooth to the left, but there is a depression in its place behind the peristome. A narrow milky band proceeds from the scrobiculation below the periphery, and gradually loses itself.

Measurements of the variety *kobeltiana*: Diam. maj. 47, min. 41, alt. 23 mm.

Hab.—Ecuador.

Isomeria subcastanea was originally described by Broderip as

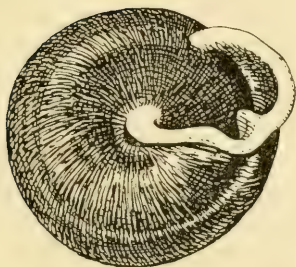
Carocolla globosa.¹ The specific name having already been employed by Sowerby for a fossil species of *Helix*,² Pfeiffer substituted the name *subcastanea*³ for it. On grounds of strict priority, Broderip's name has precedence, *globosa* not having been employed previously in the genus *Isomeria*, but I do not think it advisable to consign so well-known a name as *subcastanea* to the limbo of synonymy.



1.



2.



3.



4.

Figs. 1 and 2.—*Isomeria subcastanea* v. *kobeltiana*, n. var.

Figs. 3 and 4.—*Isomeria subcastanea*, type.

For comparison of the variety with the type, I give illustrations of one of several specimens of *I. subcastanea* from Paramba, Ecuador (3500 ft.), received from Mr. Rosenberg (Figs. 3, 4). These specimens agree with the type shells which are in the British Museum. The one figured measures diam. maj. 39, min. 34·5, alt. 20 mm. The largest of the type specimens in the Museum measures 43 mm. in diameter; but I have seen, in the possession of Messrs. Sowerby

¹ Proc. Zool. Soc., 1832, p. 30.

² Min. Conch., ii, f. 170.

³ Symb. Hist. Helic., 1842, ii, p. 103.

and Fulton, a still larger individual measuring diam. maj. 44.5, min. 38, alt. 25 mm.

Of the variety, besides the single specimen in my collection, received from a French dealer, I have seen three specimens in Mr. Da Costa's collection, and there are two specimens labelled "Ecuador" in the British Museum. I also refer to this variety the shell figured by Dr. Kobelt⁴ as *subcastanea*.

OBITUARY.

G. SHERRIFF TYE.

Born November 30, 1841, Died February 4, 1900.

MALACOLOGISTS and field naturalists in general have lost an eminent worker in the person of Mr. G. Sherriff Tye. He was born at Handsworth, near Birmingham, and resided in the same parish throughout his life. Although from a boy fond of the country and all objects of nature, his career as a naturalist may be said to date from about 1858, when he commenced to study the British Land and Freshwater Shells. For many years he took an active interest in the Birmingham Natural History Society, and formed in connection therewith a Conchological Section, of which he was President for some years. He was an early member of the then Leeds Conchological Society, and an original member of the London Malacological Society. Towards the latter end of his life he took a great interest in the formation of the Midland Malacological Society, holding the view, which the present writer heartily supports, that the formation of local societies is very desirable, for if rightly managed they may become centres of great usefulness to those whose circumstances in life place them away from large scientific libraries and museums.

Mr. Tye's published writings are few, he was always very loath to put anything into print, and yet he was certainly one of the most careful, thorough, and patient students of the mollusca it has ever been my privilege to be associated with, and in certain departments no one was more qualified to express an opinion. Some seven years ago the present writer suggested to Mr. Tye the desirability of putting on record some of the many observations and figures he had made of the British Freshwater Mussels, and although severely handicapped by the absence of a library containing the literature, at the time of his



G. SHERRIFF TYE.

death, much material had been systematically worked over, and had he lived, would shortly have been ready for publication as a series of supplements to the "Journal of Malacology," to which paper from its establishment in 1890 he had been a generous supporter.

In his home-life he was always surrounded with numerous pets. Following on a visit to the Channel Islands in 1876, he established a small marine aquarium, which had been kept in a healthy and flourishing condition up to the time of his death.

Although lost to us with an unrivalled storehouse of observations in almost every department of malacology, I am pleased to say that there is every probability of his valuable collections finding a permanent home in his native town.—W. E. C.

We regret to have to record the deaths of Gérard Vincent, Conservator of the Natural History Museum of Brussels, on April 14th, 1899, in his 75th year; Baron d'Hamonville, on November 17th, 1899, age 70; R. P. J. Hervier, on February 20th, 1900; and E. J. Lowe, on March 10th, 1900, age 75.

NOTES.

The Genus *Histiopsis*, Hoyle, preoccupied.—In the January number of that invaluable publication the "*Revue Critique de Paléozoologie*," M. M. Cossmann points out (p. 44) that the name *Histiopsis*, used for a genus of Cephalopods described by Hoyle in the "Challenger" Reports, has been previously used for mammals (*Histiops*, Pet., 1869), he therefore proposes the name *Hoyleia*.—W.E.C.

CORRIGENDA.

In Mr. H. Suter's paper "Malacological Communications from New Zealand" the following corrections should be made:

- p. 49 line 2 for 'ovoviviparous' read 'oviparous.'
 - p. 51 line 24 for '26—1—27' read '26—1—26.'
 - p. 54 line 8 from below for '*jukeriana*' read '*jukesiana*.'
 - p. 54 bottom line for 'Robinson' read 'Robison.'
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PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

16TH MEETING, FEBRUARY 9TH, 1900.

The President in the Chair.

PAPER READ.

"Some observations on the Asiatic Slug-Fauna," by Walter E. Collinge, F.Z.S.

EXHIBITS.

By Miss Litchfield: Shells of *Helix itala*, from Hastière, Belgium, also very fine collections of fossil shells from the Coralline Crag, Orford Castle, and the Red Crag, Walsingham.

By Mr. Partridge: Series of fossil shells from the Barton Clay.

By the President: Specimens in illustration of his address, and a peculiar coloured specimen of *Arion subfuscus*, from Hale, Cheshire.

17TH MEETING, MARCH 9TH, 1900.

The President in the chair.

PAPER READ.

"On some malformed specimens of *Anodonta cygnea*," by H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Specimens in illustration of his paper.

By Mr. Breeden: Shells of *Sphærium corneum*, from Toome Bridge, Co. Antrim, Ireland.

By the President: Small collection of shells of Indian *Cyclophoridae*.

18TH MEETING, APRIL 6TH, 1900.

The President in the chair.

A communication from Mr. Henry Suter, of Christchurch, New Zealand, was read, in which he intimated his desire to present to the Society a collection of Swiss Land Shells and New Zealand Land, Freshwater also Marine Shells, also a series of his writings. The Hon. Secretary was requested to convey to Mr. Suter the Society's thanks.

The following nomination for membership was read: Mr. E. B. Smith.

PAPERS READ.

"Description of a new Species of *Anadenus* from China." By Walter E. Collinge."

"Description of a new Variety of *Helix virgata*." By H. Overton.

EXHIBITS.

By the President: Specimens of *Anadenus dautzenbergi*, n.sp., from Qua Toun, Fo Kien, China; also shells of *Acarus waltoni*, Reeve, *A. phoenix*, Pfr., and *A. hæmastoma*, L., all from Ceylon.

By Mr. Overton: Shells of *Helix virgata* v. *tessellata*, n.var., from St. Catherine's Rock, Tenby; also specimens of *H. virgata* from Tenby, Deal, Dover, Gloucester, and Dudley, and 12 varieties from Tenby. *H. pisana* and the vars. *ochroleuca* and *albida*, also from Tenby.

By Mr. Bloomer: Shells of 19 species of *Achatinella*, from the Hawaiian Islands.

CURRENT LITERATURE.

Möllendorff, O. F. von.—Semper's Reisen in Archipel der Philippinen. Landmollusken.—Ergänzungen und Berichtigungen [Includes at pp. 54—60, a contribution "On the Anatomy and Systematic Position of the Genus *Philippinella*, Mölldf.," by Walter E. Collinge], 1899, Bd. viii, p. 51—98, T. v—x.

The continuation by Dr. Möllendorff of Semper's great work is valuable, not only for the new material that he has studied, but especially for the critical notes and figures of little-known species.

In the present part he deals with the genus *Helicarion*, of which he admits 18 species, and then passes to *Macrochlamys* with 20 species, next to *Macroceras* with its single form *M. spectabilis*, and concludes with the first portion of his review of *Otesia*. *Pliotropis* as a sub-genus of *Otesia* (type *O. biangulata*, Pfr.) is not marked as new, but the name appears unfamiliar.

Mr. Collinge has contributed some interesting details on the anatomy and systematic position of the recently described *Philippinella*. Of the three species placed in this genus by Dr. Möllendorff, Mr. Collinge points out that *P. philippinensis*, Semp., is really generically distinct from the other two, being more nearly related to *Parmarion*, and the genus *Parmunculus* is proposed for its reception. This genus may be separated from *Philippinella* by the external form of the animal, and also by differences in the generative organs. The anatomy of *Philippinella* is also dealt with and a new species described, *P. möllendorffi*, from Mindoro.—

E. R. SYKES.

Bouvier, E. L., et Fischer, H.—Étude Monographique des Pleurotomaires actuels. Journ. de Conchyl., 1899, pp. 1—75, pl. iv—vii.

MM. Bouvier and Fischer have given an interesting and valuable account of the anatomy of the nervous system of *Pleurotomaria quoyana*. This is prefaced by a general systematic and historical review of the genus. The anatomical part opens with a short description of the external features, followed by that of the radula and organs of sense. The two otocysts are interesting in that they illustrate an important primitive character, the presence of a considerable number of unequal-sized otoliths. In the absence of the figures we can only very briefly summarise the work. In general form the nervous system shows affinity to that of the *Fissurellidae* and *Trochidae*, but in detail there seems to be resemblances to the condition which obtains in the Amphineura. The investigations on the pedal and pallial ganglia, throw considerable light upon the subject of the origin of the pedal nerves, and the relation of these two ganglia to each other in the Gastropoda generally. Although at first sight the pallial ganglia appear to be absent, it is seen on a closer investigation that they lie in close proximity with the pedal, and the authors' conclude from the condition present in *Pleurotomaria*, and a comparison with that in many other Gastropods, that what have been generally termed pedal nerves in the Gastropoda are really mixed nerves, originating from the pedal and pallial ganglia. These latter ganglia, in many forms, have an anterior part, usually termed the pallial ganglion, and a posterior part which is fused with the pedal ganglion. In *Pleurotomaria* the pallial ganglia are not divided in this manner, and further, they are clearly marked off from the pedal by a deep groove. The authors discuss in detail the origin of the nervous system of Prosobranchs, and conclude that the condition found in *Pleurotomaria* may be regarded as intermediate between the Amphineura and Prosobranchs. Many other points of interest are discussed, not the least interesting of which is perhaps the origin of the visceral commissure.—

W. E. C.

Creighton, Charles.—Microscopic Researches on Glycogen. Pt. ii. Glycogen of Snails and Slugs in Morphological and Physiological correspondence with the Lymph System of Vertebrates. 8vo., pp. 127, 9 col'd plates. London: 1899, Adam and Charles Black.

It has long been known that molluscs, particularly the land Pulmonates, contain in their tissues large quantities of glycogen. In the work before us Dr. Creighton

gives an account of an exhaustive research, and concludes that the distribution of glycogen in the tissues of molluscs "stands therein in the same accessory or subsidiary relation to the white blood that the lymph of vertebrates stands in to their red blood." He finds in it "the morphological (as well as the physiological) beginning of the lymphatic system, which has its complete development in the vertebrates along with the acquisition of red blood."

Provided that the substance met with is in all cases glycogen, and this is open to doubt, from the fact that the author has contented himself with one test only, viz., the micro-chemical reaction with iodine, it seems to us that two of the first proofs required are 1. its general distribution throughout the different classes of molluscs, and 2. a gradual perfecting, evidencing the evolution of a lymphatic system, as we pass from the lower to the higher molluscs. Neither of these proofs are forthcoming, the author himself was struck by the absence of glycogen in many Gastropods, and it has not yet been satisfactorily shown to exist in the Cephalopoda, where there is a very perfect vascular system.

The work is very interesting and well illustrated, but much more evidence is required before physiologists can accept Dr. Creighton's views.—W. E. C.

Nabias, B. de.—Recherches sur le système nerveux des Gastéropodes pulmonés aquatiques. Cerveau des Limnées (*Limnæa stagnalis*). Trav. Lab. Soc. Sci. et Stat. Zool. d'Arcachon, Bordeaux, 1899, pp. 1—30, pls. i—iii. et 4 figs.

Professor de Nabias has made a careful histological investigation of the central nervous system of *Limnæa stagnalis*. He corroborates and amplifies the work of Lacaze-Duthiers, and adds largely to our knowledge of the nervous system generally. The paper is illustrated by three plates and a number of figures in the text, all reproductions from photographs. Some of these it is quite impossible to make out.

W. E. C.

Boycott, A. E., and Howell, E. W. W.—Contributions towards a fauna of Herefordshire. Mollusca. Woolhope Nat. Field Club, Hereford [1899]: pp. 1—104.

This is a most interesting and valuable piece of work enumerating 108 species of molluscs. Unlike most county and local lists, it treats of the Mollusca which occur in the county of Hereford, and not only of the shells of these animals. Much care has been given to the measurements of the shells of the various species and the variation in colour, banding, etc. The nomenclature has been carefully revised and although opinions may differ from those here expressed, there is evidence that the authors have thought and inquired for themselves.—W. E. C.

Scharff, R. F., and Carpenter, G. H.—Some Animals from MacGillcuddy's Reeks. Irish Nat., 1899, vol. viii, pp. 213—218.

In this interesting account of a preliminary survey of the fauna of the MacGillcuddy's Reeks, Dr. Scharff describes a new variety of *Limax marginatus*. The description is as follows: Var. nov. *niger*, Scharff. "Colour almost black, sides a little lighter, but no trace of bands, stripes, or spots. Foot-fringe black; sole light grey. Length, when fully extended, 35 mm. Keel strongly developed on posterior half of body." In general appearance, except colour, this variety is not unlike *Agriolimax agrestis*. It approaches the var. *rupicola*, L. & P.—W. E. C.

Howell, J.—List of the Mollusca of the Cleveland district. Proc. Cleveland Nat. Field Club, 1899, pp. 19—34.

Records the land, freshwater, and marine species known to occur in the district. The author states "it makes no sort of claim to be exhaustive. Its principal utility will be to form a foundation for future investigation, and to act as a stimulus thereto." Nearly 200 species are recorded and numerous varieties.—W. E. C.

Dall, W. H.—Synopsis of *Solenida* of North America and the Antilles. Proc. U. S. Nat. Mus., 1899, vol. xxii, pp. 107—112.

A very useful synopsis. *Solen mexicanus*, *Ensis californicus*, and *Tagelus poeyi* are new species. *Novaculina gangetica*, Bens., *N. (Clunaculum) mollis*, Sby., *Tagelus gibbus*, Speng., and *T. (Mesopteura) divisus*, Speng., are rediagnosed.—W. E. C.

Dall, W. H.—The Mollusk Fauna of the Pribilof Islands. The Fur Seals and Fur-Seal Islands of the N. Pacific Ocean. Washington, 1899, pp. 539—546, 1 map.

Prof. Dall records 86 forms of marine shells. A Faunal summary of those of the Pribilof Islands is given, and the range of the various species in Japan, Kamchatka coast, in the Arctic Ocean, the Aleutian chain, and California. A similar summary of the Commander Islands is added for comparison.—W. E. C.

Johnstone, J.—Liverpool Marine Biology Committee Memoirs. III. *Cardium*. 8vo., pp. vii+84, 6 pls. and map. Liverpool: 1899, T. Dobb and Co.

Mr. Johnstone's monograph is in some respects very good, in others very disappointing. In the space of 63 pages he has given a very readable account of the anatomy of *Cardium edule*, and well illustrated the same. We are disappointed to find so little that is new, while some sections require bringing up to date. Much important literature bearing upon the morphology of the Pelecypoda does not seem to have been consulted, and throughout the work generally there is an absence of modern comparative treatment.

The description of the "Renal Organ" (p. 41) is poor. It does not seem to have occurred to the author that such terms as "nephridium" and "nephrostome" are preferable to those used, which are certainly not the terms employed "by students of Biology in our laboratories and Marine Stations," for whom it is largely written.

The Appendix, on the Economy of the Cockle, contains much that is valuable and of interest.—W. E. C.

Möllendorff, O. von.—Binnen-Mollusken aus Westchina und Centralasien. L'Ann. du Mus. Zool. d. l'Acad. Imp. Sci. St. Petersburg, 1899, iv, pp. 1—99, pls. ii—viii.

This interesting and valuable contribution to the Asiatic molluscan fauna enumerates 99 species and 26 sub-species. A large number of these are new and include *Anadenus sinensis*, *Macrochlamys* 2, *Xestina* 1, *Kaliella* 3, *Patula* 1, *Camaena* 2, *Satsuma* 1, *Plectotropis* 3, *Stilpnodiscus*, nov. gen. 3, *Aegista* 3, *Eulota* 6, *Euchadra* 12, *Laocathaica*, nov. gen. 13, *Cathaica* 20, *Platypetatus* 6, *Buliminopsis* 7, *Semibuliminus*, nov. sect. 1, *Stenogyropsis*, nov. sect. 1, and *Vallonia*, 1.—W. E. C.

Herdman, W. A. and Boyce, R.—Lancashire Sea-Fisheries Memoir. No. 1. Oysters and Disease. 4to., pp. 60, pls. i—viii. London: 1899, George Philip and Son.

The results of an important investigation are here set forth very clearly. The work has been mainly carried out on *Ostrea edulis*, L., *O. virginica*, Gm., and *O. (Gryphæa) angulata*, Lam. The structure of the Branchiæ, the Protractor Pedis muscle, and Gastric gland (Liver) are carefully described and figured. Green Oysters are then discussed, and the micro-chemistry of the same, together with numerous points chiefly of interest to the pathologist. The whole results are summarised in ch. xiv (pp. 53—55).

Professor Herdman and the Lancashire Sea-Fisheries Committee are both to be congratulated on this, the first of their memoirs on Marine Biology.—W. E. C.

Bavay, A., et Dautzenberg, Ph.—Descriptions d'espèces nouvelles de l'Indo-Chine. Journ. de Conchyl., 1899, pp. 5—32, pls. 1—3.

The authors describe and figure 13 new species from this region, in addition to which they figure the following species: *Clausilia fargesiana*, Heude, *C. duclia*, Mab., *C. giardi*, H. Fischer, *C. ardoniniana*, Heude, and *Pupina laffontii*, Ancey. The new species are: *Helix* (*Chloritis*) *lambineti*, a form which approaches *H. tranquereyi*, Cr. and F., *H. (Obba) langsonensis*, *H. (Möllendorffia) spurca*, *H. (M.) messageri*, *H. (M.) callitricha*, *H. (Gastrochus) rathéleti*; seven interesting new species of *Clausilia*, viz., *C. vambucensis*, *C. rathéleti*, *C. callistoma*, *C. condeini*, *C. ferpi*, *C. grangeri*, *C. (Pseudocenia) messageri*, and *Pupina ancyri*, and *P. tonkiana*.—W. E. C.

Horst, R., et Schepman, M. M.—Catalogue Systématique des Mollusques. Mus. d'Hist. Nat. d. Pays-Bas. Pt. ii. 8vo., pp. 184. Leyden: 1899, E. J. Brill.

The second part of this useful catalogue fully maintains the standard set in part i. The collection is an exceedingly valuable one and contains many type species. The nomenclature used is not always correct both as regards priority and spelling. A useful purpose would have been served if the species had been numbered. The present part enumerates nearly 1300 species and upwards of 150 varieties.—W. E. C.

Melvill, J. C., and Standen, R.—Report on the Mollusca of the "Jackson-Harmsworth" Expedition to Franz-Josef Land (1896—97), and of the "Andrew Coats" Cruise (1898) to Kolguev, etc. Mem. and Proc. Manchester Lit. Phil. Soc., 1899, vol. xlv, pp. 1—14, fig.

Buccinum brucei from Günther Sound, Franz-Josef Land, is the only new species, it is distinguished by its narrow form, close-set whorls, and small aperture. In the authors' opinion it does not appear to be nearly allied to any other species of the genus, arctic or otherwise.—W. E. C.

Hedley, Charles.—Description of a new genus, *Austrosarcpta*, and notes on other molluscs from New South Wales. Proc. Linn. Soc., N.S.W., pp. 429—434, figs. 1—7.

Mr. Hedley describes a new genus of the sub-family *Sarcptinae*. It is characterised by an amphidetic internal ligament and a distinct though feebly separated resilium. The type, *A. picta*, is figured and described, and is perhaps the smallest Australian pelecypod known, a large specimen measuring: height 2, length 2·3, breadth of single valve 8 mm. *Tenostoma starki* is an interesting new species. *Cassia nana*, Tenison Woods, and *Cantharus waterhousei*, Brz., are figured for the first time, also the animal of *Solen sloanii*, Gray.—W. E. C.

Hedley, Charles.—Descriptions of new Land Shells, with notes on known species. Rec. Aust. Mus., 1899, vol. iii, pp. 151—154, pl. xxviii.

The new species are *Paratina mayana*, *Endodonta aculeata*, *E. norfolkensis*, and *Dendrotrachus mentum*. *Tornatellina wakfieldae*, Cox, is figured for the first time. On anatomical grounds Mr. Hedley transfers *Cochlostyla hindei*, Cox, from *Helicostyla* (cf. Pilsbry, *Man. Conch.*, 1894, p. 229) to *Papulina*. Figures are given of the jaw, radula, and generative organs.—W. E. C.

Stempell, W.—Die Muscheln der Sammlung Plate. (*Systematische Übersicht*). Zool. Jahrb. Suppl. iv, 1899, pp. 217—251, T. 12.

Dr. Stempell enumerates 57 species, of which the following are new: *Arca* (*Barbatia*) *platei*, *Avicula* (*Melcaurina*) *magellanica*, *Lasaea macrodon*, *Diplodontina tumbesiana*, *Lepton platei*, *Venerupis fernandesiana*, *Teredo* (*Xylotrya*) *martensi*, *Mytilus magellanicus*, Chemn., v. *curvata*, *Solen macha*, Molina, v. *coquimbana*. *Diplodontina* is a new genus. For the *Pecten australis* of Philippi,

Dr. Stempell proposes the name *P. rosaceus*, the former being preoccupied by Sowerby (1).—W. E. C.

Stempell, W.—Zur Anatomie von *Solomya togata*, Poli. Zool. Jahrb. (Abth. f. Morph.), 1899, Bd. xiii, pp. 89—170, T. 8—10.

Supplementing his valuable researches upon the *Nuculidae*, Dr. Stempell has given a very complete account of the anatomy of *Solomya togata*, Poli. The work was undertaken with the object of determining more exactly the value of the order Protobranchiata, constituted by Pelseneer in 1889 for the *Solomyidae* and *Nuculidae*. In accepting this order the author gives an emended definition, eliminating many of the characters given by Pelseneer as not being essentially characteristic. The two families are carefully compared and the differences between them stated. The *Solomyidae* are regarded as the more specialised, a conclusion previously arrived at by Pelseneer, but Dr. Stempell differs from that author in not agreeing that the *Solomyidae* have been derived from the *Nuculidae*, he concludes, that in many points the former show greater simplicity due probably to the nature of their environment, and that both have been derived from a common ancestor possessing primitive characters, many of which have been retained.—W. E. C.

Stearns, R. E. C.—List of shells collected * in Heron and Eagle Lakes, Minnesota, with notes. Proc. U. S. Nat. Mus., 1899, vol. xxii, pp. 135—138.

Records 18 species and numerous varieties.

Stearns, R. E. C.—Description of a new variety of *Haliotis*, from California. Ibid., pp. 139—142.

H. fulgens, Phil. v. nov. *walullensis*. Differs from the type in its more elongate and flattened form, its constantly finer, spiral threading, and its paler nacre.

Kelly, H. M.—A Statistical Study of the Parasites of the *Unionidae*. Bull. Illinois State Lab. N. H., 1899, vol. v. pp. 399—418.

Professor Kelly records some very interesting observations upon the parasites found infesting 44 species of American *Unionidae*. The commonest parasite is *Aspidogaster conchicola*, v. Baer, others mentioned are *Catylaspis insignis*, Leidy, 4 species of *Distomidae*, *Bucephalus polymorphus*, v. Baer, and two other cercaria, various species of *Atax*, 2 species of Infusoria, and an oligochaete worm. The largest number of different parasites in any one species was found to be 7, many had 6, 5, or 4. Six very carefully prepared tables are given. As a result of his studies the author arrives at the following conclusions: "The host species seem to exhibit unlike capacities for infestation, both as to the number of individuals and the kinds of parasites present. It appears that the differences shown are attributable only in a minor degree to the age and size of the host, the size of the stream, and the density of the unionid population. They are not sufficiently accounted for by the seasonal variation,—which is shown to exist to some degree at least in the case of certain parasites,—nor by the very slight difference in general structure between the various host species. The evidence therefore seems to indicate that the capacity for infestation in each host species is to a large extent a specific characteristic."—W. E. C.

Knight, G. A. F.—The Etymology of the names *Azeca* and *Assimineæ* of Leach. Journ. Conch., 1900, vol. ix, pp. 271—76.

This is an interesting and useful paper and throws much light upon many of the generic terms used by Leach, whose derivation has hitherto been doubtful. The two in the title of this paper were regarded in 1842, by a committee of the British Association, as being "without any derivation or meaning whatever," and even Jeffreys says of *Assimineæ*, "a ridiculous name." Mr. Knight enumerates the following names, and gives their probable derivation: *Thracia*, *Mysia*, *Bitlia*, *Thyatira*, *Lasæa*, *Dipsas*, *Pharus*, *Magdala*, *Barnea*, *Azor*, *Macoma*, *Orontea*.

Pera, *Zucanthusa*, *Alavia*, *Orisa*, *Eledone*, *Cydippe*, *Autonoë*, *Damaris*, *Zippora*, *Balcis*, *Sabanoca*, *Rorania*, *Udinusia*, *Gobrius*, *Arianta*, *Tachea*, *Azeca*, and *Assimineae*.—W. E. C.

Collinge, W. E.—On a Collection of Slugs from South Africa, with Descriptions of some new species. *Ann. Sth. Afr. Mus.*, 1900, vol. ii, pt. i, pp. 1—8, pls. 1—11.

The new species are *Amalia ponsonbyi*, *Apera natalensis*, *Oopelta flavescens*, and *O. granulosa*. *Limax variegatus*, Drp., and *Arion fuscus*, O. F. Müll., are additions to the fauna.

Hedley, Charles.—A Zoogeographic Scheme for the Mid-Pacific. *Proc. Linn. Soc., N.S.W.*, 1899, pp. 391—417.

Cossmann, M.—Sur la découverte d'un gisement palustre à Paludines dans le terrain bathonien de l'Indre. *Bull. Soc. Geol. France*, 1899 (53), T. xxvii, pp. 136—143, figs. 1—5.

Webb, W. M.—Some Mollusca and the Microscope. *Ann. of Micros.*, 1900, pp. 1—5, 12 figs.

Bavay, A., et Dautzenberg, Ph.—Description de coquilles nouvelles de l'Indo-Chine. *Journ. de Conchyl.*, 1899, vol. xlvii, pp. 275—296, pl. xii.

Thirteen new species of *Clausilia* and 9 varieties are here described under the following names: *C. lemyrei* and v. *fusca*, *C. auricoma*, *C. babeensis*, *C. gisota*, *C. backanensis*, *C. (Pseudonemia) dorri* and vars. *elongata*, *minor*, and *cristator*, *C. thatkheana* and vars. *obesa* and *minor*, *C. dichroa*, *C. semipolita*, *C. falcifera*, *C. eupleura*, *C. sykesi* and v. *major*, *C. hamonvillei* and v. *obsoleta*.—W. E. C.

Dautzenberg, Ph.—Description d'une nouvelle espèce d'*Achatina* provenant du Haut-Conga. *Ann. Soc. Roy. Malac. Belgique*, 1899, T. xxxiv, pp. 27—28, fig. *Achatina weynsi*, n. sp.

Pritchard, G. B.—Mollusca, pp. 135—141 in "Handbook of Melbourne," for the use of members of the Australian Assoc. Adv. Sc., Melbourne, 1900.

Contains an account of the various collecting grounds round Melbourne, the Mollusca found there, and notes on their habits.

Hervier, J.—Le Genre *Columbella* dans l'Archipel de la Nouvelle-Calédonie. *Journ. de Conchyl.*, 1899, vol. xlvii, pp. 303—391, pls. xiii—xiv.

M. Hervier gives a valuable account of the species of *Columbella* occurring in the Archipelago of New Caledonia. In addition to a large number of new varieties, the following new species are described and figured: *C. goubini*, *C. subphilodicia*, *C. desmia*, *C. loyaltiensis*, *C. procellarum*, *C. lifouana*, *C. nanisca*, *C. ocellatula*, *C. brevissima*, *C. roseofincta*, *C. succinea*, *C. obsula*, *C. dautzenbergi*, *C. sublachryma*, *C. pinguis*, *C. alphonisiana*, *C. iozona*, and *C. fischeri*.—W. E. C.

GENERAL REVIEWS.

Text-Book of Palaeontology.—By Karl A. von Zittel. Translated and edited by Charles R. Eastman. Vol. i, pp. viii+706, 1476 woodcuts. London: 1900, Macmillan & Co., Ltd.

In bringing out an English edition of Professor von Zittel's well-known work, Eastman has very wisely availed himself of the assistance of a series of specialists

in the different departments. The chapters on the Protozoa and Coelenterata are practically as in the original *Grundzüge*, all the others have been remodelled, enlarged, and brought up to date. The sections dealing with Polyzoa, Brachiopoda, Mollusca, and Trilobites have been entirely rewritten. The work therefore is something more than a translation, it is a new treatise on invertebrate palaeontology founded upon Professor von Zittel's *Grundzüge der Palaeontologie*, and it is greatly to be regretted that the different collaborators have not followed more closely the method of treatment in that invaluable work.

The two great faults, which stand out conspicuously, are the excessive subdivision of the various sub-kingdoms into families, sub-families, and genera—a feature in which American zoologists excell—and the large number of cases where the authority for such divisions is omitted. In looking through the classification the student is bewildered to know if these families, etc., are here described for the first time or hitherto. Many of the divisions are new, though in some cases both the authority and definition are omitted. However desirable it may have seemed to include the special views on classification of the various authors, a students textbook is surely the last place in which to introduce such changes. We do not hesitate to say that so far as the general bulk of palaeontological students are concerned, the value of this work has been greatly impaired by such treatment, particularly so as regards the Polyzoa, Brachiopoda, Mollusca, and Arthropoda.

The sub-kingdom Mollusca has been treated of by Dr. Dall (Pelecypoda), Professor Pilsbry (Scaphopoda, Amphineura, Gastropoda, Pteropoda), and Professor Hyatt (Cephalopoda).

Dr. Dall's work is perhaps the most satisfactory, and Professor Hyatt's the least so. Many of the minor errors in all the classes might have been avoided with a little more care. In not a few cases the essential characters of a family have been overlooked or omitted, this is particularly apparent amongst the Amphineura and Gastropoda, in fact throughout the sub-kingdom, excepting the Pelecypoda, the definitions are inadequate.

In conclusion, we think the advanced student and others will find Dr. Eastman's book a valuable work of reference, the general student, however, still awaits a reliable work in the English language.—W. E. C.

An Elementary Course of Practical Zoology.—By the late T. Jeffery Parker and W. N. Parker. 8vo, pp. xii+608, and 156 figs. London: 1900, Macmillan & Co., Ltd.

As a handbook to an elementary course of study in practical zoology the work before us will be welcomed by both teacher and student. Adopting the method pursued in Huxley and Martin's "Elementary Biology," the authors have produced a very readable and practical guide which will take its place in the majority of zoological laboratories. It has long been felt that the present works on practical zoology were unreadable, and largely out of date, and often the desire has been expressed for a new and revised edition of Huxley and Martin's admirable work. Professor Newton Parker is to be congratulated on having produced a work which embraces all the good points of the former.

The accounts of the different types are well arranged and carefully thought out, and with a few exceptions the practical directions are all that could be desired.

The illustrations, many of which are from Professor Parker's other works, and Professor Howe's "Atlas," have been selected with discretion, and are all excellent.
W. E. C.

A Treatise on Zoology.—Edited by E. Ray Lankester. Pt. III. The Echinoderma. By F. A. Bather, assisted by J. W. Gregory and E. S. Goodrich. 8vo., pp. viii+344. London: 1900. Adam and Charles Black.

The work before us marks a distinct advance in the style and scope of zoological

text-books. Hitherto it has been the custom for some individual zoologist to treat of the whole Animal kingdom, so far as recent forms were concerned. While this was to a certain extent possible, as regards the subject, twenty or thirty years ago, the wealth of work and workers during the intervening period, has made it more and more evident, that for the production of a reliable work, and one which would remain for some considerable time a standard treatise, the co-operation of a series of specialists, each treating of his own special study, was absolutely necessary. Further, it is obvious that a study of recent forms of animal life, apart from their fossil relations, can only end in a very one-sided and incomplete knowledge, it is therefore an excellent departure in the systematic treatment of zoology, to find the fossil forms so carefully and elaborately set forth as in the present work. Finally, no pains has been spared to make the Bibliographical references of some value. The treatment of references in some of the most recent zoological text-books is little less than disgraceful. It is not at all uncommon to find many entirely incorrect, while the rule seems to be to omit either the year of publication, the number of the volume, or the series, and to abbreviate the title of the work until unrecognisable.

Throughout the work the style and method of treatment are admirable, and all three authors are to be congratulated on the clearness and force which characterises their respective contributions. Mr. Bather is responsible for the major portion of the work, viz., five of the eight chapters. The first gives a general description of the Phylum, and here most zoologists will regret that the morphology has been treated with such brevity: the remaining four chapters deal with the Cystidea, Blastoidea, Crinoidea, and Echinoasteroidea. Mr. Goodrich contributes the chapter on the Holothurioidea, which though brief is excellent. The two remaining chapters on the Stelleroidea and Echinoidea are the work of Dr. Gregory.

The illustrations, of which many are original, are numerous and clear.

Accepting the present volume as typical of the series, the work worthily represents the Oxford School of Zoologists, whose success—one might almost say foundation—is due in no small measure to the Editor of this comprehensive and valuable Treatise.—W. E. C.

EDITOR'S NOTES.

We have received from Messrs. Sowerby and Fulton a set of their admirable Catalogues, copies of which should be in the hands of every museum curator and collector. The five catalogues extend over 100 pp., and enumerate nearly 12,000 species. They are well printed, in double columns, with wide margins each side, so that they may be useful as check-lists.

Reviews of two very important works are unavoidably held over till our next issue viz: those of Sarasin's "Land Mollusken von Celebes," and Dr. Wilhelm Pfeiffer's study of the Genus *Triboniophorus*.

To the April number of "The Nautilus," Mr. Bryant Walker contributes an interesting article on the *Planorbis corpulentus* of Say. He clearly shows that it is entitled to rank as a valid species, and further that it is very distinct from *P. trivolvis* on the one hand, or *P. ammon* or *binneyi* on the other.

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VOL. VII.

A LIST OF A SMALL COLLECTION OF SHELLS
FROM CHINA.

By EDGAR A. SMITH, F.Z.S.,

British Museum (Natural History), London.

IN 1899 Capt. A. W. T. Wingate made a journey across China, on the route collecting Zoological specimens, which he very liberally sent to the Natural History Museum, South Kensington. Starting from Shanghai he ascended the Yang-tse River in a Chinese gunboat as far as Yo-tchau, and thence, crossing the Tong-Ting Lake, proceeded up the Yuen River, across the Hunan and Kwei-chow provinces to Yunnan city, and thence to Bhamo in Burma. The following is a list of the shells obtained on this journey. The most interesting specimens are two series of *Melania gredleri* and *Vivipara auriculata*. The latter especially shows the remarkable variation which occurs so frequently or invariably in freshwater species. Taking the two extreme types of this species, one would never for a moment consider them as forms of one and the same species, yet it seems impossible to do otherwise when the intervening links are studied.

(a.) FRESHWATER FORMS.

1. *Vivipara chinensis*, Gray.

Hab.—Hunan and Kwei-chow.

2. *Vivipara quadrata*, Benson.

Tong-Ting Lake, Hunan.

3. *Vivipara*, sp.

Hab.—Hunan.

A solid form, of a uniform olivaceous colour or with three more or less dark zones upon the last whorl, varying very little in form, some specimens however, being a trifle less globose than others. They are always imperforate, none exhibiting the slightest rimation. The periostracum has the fine lines of growth crossed by fine spirals giving the surface a textured appearance.

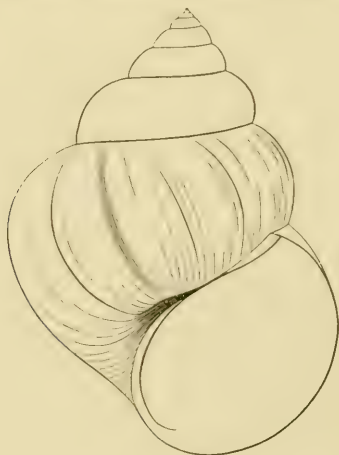
4. *Vivipara*, sp.

Hab.—Hunan.

Smaller and less globose than the preceding species, mostly subrimate, plain or banded, with lines of growth only, no spiral striation, having the body-whorl slightly keeled or angled at the periphery.

5. *Vivipara wingatei*, n. sp.

Testa rimata, turbinata, tenuis, dilute rufescens vel pallida, epidermide tenui olivacea, oblique strigata induta; spira turrita, ad



Vivipara wingatei, n. sp.

apicem acutissima et nigrescens; anfractus 7 convexi, lineis incrementi

tenuibus striati, striis spiralibus plus minus conspicuis sæpe sculpti, ultimus interdum malleatus, subglobosus; apertura obliqua, inverse auriformis, longit. totius $\frac{1}{2}$ paulo superans; peristoma tenue, interdum nigro marginatum, margine columellari incrassato, vix reflexo.

Longit. 57 millim., diam. maj. 45, min. 40. Apertura 31 longa, 23 lata.

Hab.—Hunan.

A fine large species, remarkable for its thinness, convex whorls and acute apex. The surface has a somewhat textured appearance (more noticeable in some specimens than others) produced by fine spiral striæ crossing the lines of growth. One of these spirals around the middle of the upper whorl is sometimes rather prominent giving a slight subangled appearance.

6. *Vivipara auriculata*, Martens.

Hab.—Taoyüan Lsien, also Hung Chiang, Province of Hunan.

A most instructive series from the above localities showing the connection of the *Paludomus rusiostoma* of Gredler with this species. Starting with quite globular specimens every intermediate form is met with until we arrive at the typical auriculated type. Some of these are very large and solid, the finest specimen being 39 millim. in



Vivipara auriculata Marts.

length. The more rounded examples (*rusiostoma*) generally exhibit three more or less distinct zones within the aperture, whereas this part in the typical form is uniformly whitish. Several forms described by Heude under the generic title of *Rivularia* (*Mém. sur la Chine*, pl. xl and xli) also appear to belong to this polymorphous species.

7. *Melania baccata*, Gould.

Hab.—Taoyuen, Hunan.

Two specimens, one strongly nodosely cancellated, the other spirally costate only.

8. *Melania cancellata*, Benson.

Hab.—Tungting hu = Tong Ting Lake, Hunan.

9. *Melania gredleri*, Böttger.

Hab.—Chin Chow, T'aoyüan, Hunan.

Most of the specimens are very short and broad, much shorter than the shells figured by Heude (*Mém. sur la Chine*, vol. i, pl. xli, figs. 30, 32). An averaged size example is 27 millim. in length and 12 in breadth.

10. *Unio leai*, Gray.

Hab.—China. Exact locality not stated.

11. *Unio shanghaiensis*, Lea.

Hab.—Lu She.

12. *Unio*, sp.

Hab.—Chien Yang.

A single valve only.

13. *Corbicula*, sp.

Hab.—Pu Shi.

14—16. *Corbicula*, spp.

Hab.—Pu Shih, Yüan Chow, Chin She, Tsing She, Chien Yang, T'aoyüan, Hunan.

A series of specimens from these localities apparently belong to three or four species, but to attempt to distinguish them would necessitate long and special study of the genus.

17. *Modiola fortunei*, Dunker.

Hab.—Hunan.

A single specimen of a richer browner tint than the type. (*Conch. Icon.*, vol. x, fig. 75).

18. *Mytilus*, sp.

Hab.—Hunan.

A single specimen of a very slender species, perhaps belonging to *M. martensi* referred to by Neumayr (*Neu. Jahrb. Mineral. etc.*, 1883, vol. ii, p. 22). It is 20 millim. long, 8 broad and 9 in diameter. In form and colour it somewhat resembles Reeve's figure of *M. minimus* (*Conch. Icon.*, vol. x, pl. xi, fig. 56), but it is rather more slender and has a sharper umbonal ridge. The beaks are acute, but not quite in contact at the tips. The valves are thin, finely concentrically striated, iridescent within, edentulous, but with a slight shelf at the apex which in consequence is hollow as it were within. The ventral side is concave with a narrow byssal opening. *Dreissensia swinhoei* of H. Adams belongs to the same group as the present species, having a similar hinge and the iridescent nacreous inner surface.

(b.) TERRESTRIAL FORMS.

19. *Cyclophorus punctatus*, Grateloup.

Hab.—Yan Chow, Yuh Ping.

20. *Succinea chinensis*, Pfeiffer.

Hab.—Chin She, Nanking.

21. *Eulota ravida*, Benson.

Hab.—Tsing she Hün, Chungleh.

22. *Eulota phragmitum*, Heude.

Hab.—Yaochou.

23. *Eulota huberiana*, Heude.

Hab.—Yan Chow, Tsing She.

Smaller than Heude's figure (*Mém. sur la Chine*, vol. i, pl. xvii, fig. 1).

24. *Eulota similaris*, Férussac.

Hab.—Yaochou, Chen Kiang.

DESCRIPTIONS OF TWO NEW SPECIES OF SHELLS: MUREX MARCOENSIS AND CASSIS BOOLEYI.

By G. B. SOWERBY, F.L.S.

Murex marcoensis, n. sp.

Testa clavæformis, rufo-aurantia, antice purpureo tincta; spira mediocriter elata, acute conica; anfractus $6\frac{1}{2}$, convexi, primi 3—4



Murex narcoensis, n. sp.

longitudinaliter confertim costati, deinde trivariicosi, sub-distanter crassicostati, undique spiraliter lirati, varicibus crassiusculis, rotundatis, hic illic brevissime spinosis; anfractus ultimus superne obtusissime angulatus, infra constrictus; rostrum sub-elongatum, rectiusculum, superne breviter spinosum, infra medium glabratum, purpureo tinctum, ad extremitatem albidum; apertura rotunde ovalis, intus albida crenulata; labrum serratum, extus crassivaricosum; columella callosa, polita, inferne leviter plicato rugosa.

Long. 31, diam. 16 mm.

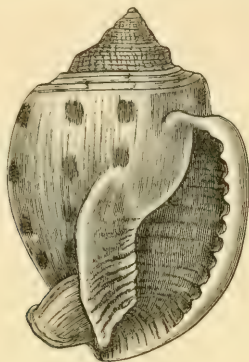
Hab.—Marco, Florida.

I have been unable to indentify this species with any of its congeners. The specimens are prettily coloured, pink and reddish orange, tinged with purple in the middle of the rostrum, which is tipped with white. The varices are very sparingly spined, and some specimens not at all, excepting at the upper end of the rostrum. Compared with *M. chrysostoma* this shell is uniformly much smaller, narrower in proportion, less angular, and different in colour.

Cassis booleyi, n. sp.

Testa ovata, fulvo-albida, maculis numerosis quadratis rufo-fuscis quadriseriatim dispositis ornata; spira mediocriter elata, conica,

acutiuscula; anfractus 7; primi 2 læves, sequentes spiraliter sulcati, oblique filo-striati, sutura augusta impressa sejuncti; ultimus convexus,



Cassis booleyi, n. sp.

lævigatus, longitudinaliter irregulariter plicato-striatus, obtusissime angulatus, supra angulum leviter concavus, liris spiralibus 2—3 instructus, basim versus subobsolete sulcatus; apertura oblonga, labrum extus crassivaricosum, intus lirato dentatum; columella expansa, rugoso plicata; canalis valde contorto recurvus.

Long. 45, diam. 31 mm.

Hab.—Port Blair, Andaman Islands.

This species, collected at the above locality by the late Mr. G. H. Booley, differs from *C. pila* to which it has some general resemblance in the following particulars. The body whorl, instead of being regularly grooved as in *C. pila*, is almost smooth but longitudinally striated; it has an obtuse angle at the top, between which and the suture it is slightly concave, with two or three distinct spiral ridges. The examination of a considerable number of specimens of both species has confirmed my opinion that they are distinct.

MALACOLOGICAL NOTES.

By E. R. SYKES, B.A., F.L.S.

1. On a three-valved *Ichnochiton*.

THE specimen now described was collected by Mrs. A. F. Kenyon in Victoria and presented by her, very recently, to the British Museum. It is preserved in spirit and measures, when contracted, 13 by 8 millim. From the external appearance it appears to belong to *I. contractus* (Rve.).

The tail-valve occupies a space rather more than equal to that taken by the head and median valves together. At the posterior end the mantle is drawn up much as in *Schizochiton*, but this may be due



Fig. 1.—Three-valved *Ichnochiton*.

to contraction, or to the fact that the tail-valve has received some injury. The middle valve has the lateral area on one side much exaggerated and divided by a radiating line. The head-valve is normal.

Specimens of Polyplacophora, having less than the normal number of valves, appear to be very scarce. Seven-valved specimens are known, indeed there is one, a *Chiton*, in the British Museum, but I have never seen one with less than this number.

2. On the occurrence of *Cryptoplax* in South Africa.

The genus *Cryptoplax*, so far as known, ranges from the Philippines to the Australian Province. The occurrence therefore at Umkomaas, in Natal, of a specimen apparently belonging to that genus, is of unusual interest. The single specimen, which was collected by Mr. Burnup, and forms part of his collection, measured when alive, apparently, about 14 millim. in length but was curled up and shrunk in drying.

The girdle shows no signs of pores but is densely clothed with small spicules, forming bunches at the sutures. The valves, partly covered by the girdle, are all in contact and have no intervening area. The head-valve is granulose, while the other valves have an almost smooth central area, and the lateral and median areas are

sculptured with bold, slightly granulose ridges, this sculpture becoming more obsolete and the ridges breaking up into granules, as we proceed from the tail to the head-valve.

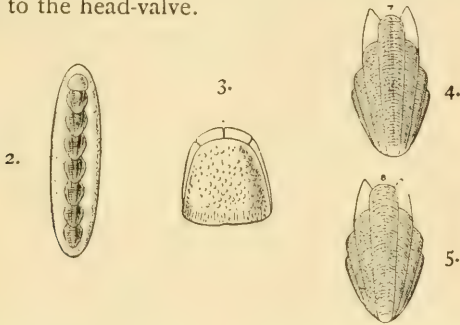


Fig. 2.—*Cryptoplax*, sp. Fig. 3.—Head-valve of same.

Figs. 4 and 5.—Seventh and eighth valve.

On comparing this species with young specimens of *C. striatus* (Lamk.), I have been unable to find specific characters sufficient to justify the description of it as distinct. Of course with only one specimen, it is by no means easy to arrive at the true specific value, but the occurrence of any specimen of the genus so far from the known habitat is of sufficient interest to be worthy of record.

Should more material come to hand, I shall hope to return to the subject.

3. Description of *Acroptychia pyramidalis*, n. sp.

Testa aperte umbilicata, pyramidata, turbinata, solidiuscula, leviter striata, (detrita) castanea, maculis albidis tessellata, linea unica inconspicue nigro-castanea cincta; anfr. $5\frac{1}{2}$, plano-convexi, ultimus turgidus; apertura subverticalis, subcircularis, supra angulum obtusum formans, peristomate incrassatulo, subreflexo.

Alt. 15; diam. max. 14, min. 11 millim.

Hab.—Madagascar. 6. 7.



Figs. 6 and 7.—*Acroptychia pyramidalis*, n. sp.

In colour pattern somewhat recalling *A. reticulata* (Ad. and Rve.), but may be severed from young specimens of that species, by the whorls being much flatter, the shell more elevated and thicker, and

the umbilicus not being so open. From *A. aequivoca* (Pfr.), which it most nearly resembles in colour, it may be separated by the size, the more elevated form, and the thickened but not reflected lip. *A. tubularis* (Morel.) is about the same size, but the shape is different and *A. pyramidalis* is not marked by the last whorl being so much drawn to one side.

The known species of *Acroptychia* appear to be as follows: *A. aequivoca* (Pfr.), 1857. (Synonym *A. manicata*, Cr. and Fisch., 1882.) *A. albocincta*, E. A. Smith, 1893. *A. metableta*, Cr. and Fisch., 1874. *A. notabilis*, E. A. Smith, 1892. *A. reticulata* (Adams and Reeve), 1848. *A. tubularis* (Morelet), 1861.

4. Description of *Clausilia granulosa*, n. sp. from Peru.

Testa magna, elongato-fusiformis, solidula, sub lente spiraliter et transverse striata, grisea, anfr. decussatuli, periostraco leviter induti. Anfr. (spec. trunc.) 6, plano-convexi, sutura impressa, ultimus deorsum angustatus, solutus, protractus, basi subrotundatus. Apert. magna, ovato-circularis; lamellæ approximatae, validæ, marginales, supera verticalis, infera subhorizontalis, subcolumellaris nulla; plica principalis valida sed curta, cum lunella arcuata angulum efformans; peristoma expansum, reflexum, solutum, albidum.

Long. 29; lat. 7.6 millim. Long. apert. 8; lat. apert. 7.6 millim.

Hab.—Peru (Dedit G. B. Sowerby).

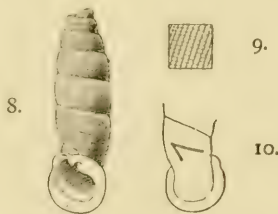


Fig. 8.—*Clausilia granulosa*, n. sp. Fig. 9.—Sculpture of same.

Fig. 10.—Posterior view of penultimate whorl.

A single dead shell of this handsome species was presented to me some years ago by Mr. G. B. Sowerby; I have delayed describing it in the hope either that I might obtain better material, or that some other person might be in a more fortunate position.

The sculpture appears to be due to both revolving and transverse striæ, which produce a decussated appearance, the spirals becoming comparatively much weaker on the lower whorls.

ON A BRITISH SPECIES OF MYRINA, WITH A NOTE ON THE GENUS IDAS.

By J. T. MARSHALL,

Sevenoaks, Torquay.

IN the month of June last an Aberdeen trawl-boat brought into that port the skull of a whale, which arrested the attention of Mr. James Simpson, an indefatigable collector of the Mollusca, who resides in that city. When he went on board to examine it he found the skull bare of flesh, but covered with an oily exudation caused by some days exposure to a very hot sun, and although it was almost unapproachable on account of the indescribable stench, he went close enough to observe a number of "small mussels" clinging to it, and secured some of them. He writes me that "there must have been thousands on the skull, but by far the largest number were baby shells. The adults were anchored by a byssus in the cavities, while the young swarmed over the smooth surfaces. They were very much decomposed, so I was glad to get rid of the animal matter as soon as possible." One of the crew of the trawler, known to Mr. Simpson as a veracious man, at once told him that the whale's skull was brought up in the trawl "on the north edge of the Great Fisher Bank, about 150 miles N. E. of Aberdeen, which would be nearly 100 miles east of the Orkneys, in 40 to 50 fathoms."

Mr. Simpson having submitted some of these "mussels" for my opinion, I at once saw they were unlike any species yet found in our seas, and that they corresponded very closely indeed to the *Myrina* of H. and A. Adams, a genus founded on a single Japanese species. I propose therefore to name this shell *Myrina simpsoni*, after the discoverer. That it is a native of the British seas is placed beyond doubt from the fact that, wherever the whale's skull may have come from originally, it was trawled from the bottom, where it had sunk a foot deep in the mud, the marks of which were plainly visible. The Great Fisher Bank is practically a continuation of the Doggerbank, and extends up the North Sea from the Firth of Tay to the extremity of Caithness.

The animal could not be described on account of the collapsed condition the specimens were in. An attempt to soak one or two that were dried up revealed nothing of any consistency except the adductor muscles, which are unusually large and strong.

Myrina simpsoni, n. sp.

The shell is transversely oblong, convex, and of a thin texture; sculpture, microscopic and close-set striæ which radiate from the beaks, and equally fine transverse striæ, with coarse and irregular lines of growth; in the centre of each valve are five or six longitudinal obtuse riblets, which cross the shell from the upper to the lower margin; epidermis yellowish-brown, persistent, highly polished, with a blistered appearance over the central riblets; colour under the epidermis pearl-grey; margins nearly straight at the upper part, ascending very slightly from the umbones, gently incurved in the lower margin, rounded on the anterior side with a greater slope from the beaks, and sloping from the back on the posterior side and evenly rounded, though this part is broader in some specimens than in others, while both sides are always deeper than the centre; umbones very gibbous and swollen; beaks incurved, and placed very near the anterior side; ligament internal, large and strong; inside pearl-grey, iridescent, microscopically rayed; hinge-line almost straight; hinge-plate narrow, thickened, slightly and very finely crenated on the posterior side; there is a small and obtuse excrescence on the anterior side just below the beak; edges plain; muscular scars very slight.

Length 0.45 inch. Breadth 1 inch.

Hab.—North edge of the Great Fisher Bank, about 150 miles N.E. of Aberdeen, in 40 to 50 fathoms.

I have given the average dimensions, but the largest are just under $1\frac{1}{4}$ in. by $\frac{1}{2}$ in. The central ribs or corrugations vary in degree from being merely faint rays to well-developed corrugations, and they probably serve the purpose of strengthening the shell in that part, like the internal strengthening ribs of *Isocardia cor*. These riblets show through the shell but are not impressed on the inside, being obviously only surface sculpture.



Fig. 1.—*Myrina simpsoni*, n. sp. View from the right side.

Figs. 2 and 3.—Hinge-line of left and right valves.

This shell is like, except in size, *M. coppingeri*, E. A. Smith,¹ a "Challenger" species from Cape York, N. Australia, 1400 fathoms; but this is wider in proportion to length, the lower or ventral margin

¹ "Challenger" Pelecypoda, p. 281, pl. xvi, figs. 9, 9b.

is more incurved, with central rays or riblets, and the hinge-line is crenated on one side only of the ligament. It also resembles *Idas argenteus*, Jeffreys,² but this is very much larger, the lower margin is concave, the epidermis does not rise into fibrous excrescences on the posterior side, and the hinge-line is striated on one side only. Gwyn Jeffrey's figure must not be taken as correctly representing *I. argenteus*, that species having been described and figured from a decorticated valve, which could not exhibit the fibrous epidermis, in addition to which, the beaks are shown small and pointed, while they should be incurved and invisible, with large obtuse umbones as in *Modiola*, and similar to *Myrina coppingeri* and *M. simpsoni*; while it must also be remembered that *I. argenteus* is variable in its outlines, in consequence of its peculiar adaptability to habitat. In specimens of the same size the two are very closely allied, and in a strong light some examples of *I. argenteus* are found to have rays down the centre of each valve corresponding to the strengthening riblets of *M. simpsoni*.

Idas of Jeffreys is no more than a synonym of *Myrina*, H. and A. Adams. A valve was dredged in mid-Atlantic by the "Valorous" in 1450 fathoms, and another on the coast of Portugal by the "Porcupine" in 994 fathoms (not Bay of Biscay, wrongly recorded by Jeffreys). In describing the genus from these two valves, Gwyn Jeffreys ventured to describe the ligament or cartilage as external, and in describing the species (*I. argenteus*) he wrote "ligament not observable, the specimens being imperfect single valves, but certainly not internal"; while Mr. Edgar A. Smith, relying on this statement when describing his *Myrina coppingeri*, separates it, and rightly so, from *Idas* because though it "has the hinge-plate similarly crenated, the ligament is described as external," overlooking Gwyn Jeffrey's account of the discovery of living specimens "between the Hebrides and Faroes in 516 fathoms, inhabiting deserted tubes of *Teredo megotara* in a piece of pine-wood, and in which the *Idas* were affixed by a byssus. * * * An internal and long cartilage covers the hinge, and I was mistaken as to this when I described the species from two small valves." So that the genus *Idas* would appear to be quite superfluous. The author had originally written "Perhaps allied to *Myrina*, although that genus has an internal ligament and wants the hinge-plate crenated." We have seen that the former attribute was an error, and the latter cannot be considered a generic distinction seeing that it is a character equally shared by *Modiolaria*, *Dacrydium*, and *Crenella*, in addition to which

² "Valorous" *Mollusca*, Ann. Mag. N. Hist., 1876, p. 248; and Moll. "Lightning" and "Porcupine," Proc. Zool. Soc., 1882, p. 683, pl. xlv, fig. 3.

I have a valve of an undescribed *Myrina* from Korea in which the hinge-plate is strongly crenated on both sides of the ligament. When Gwyn Jeffreys, however, put the matter right about the ligament, he did not formally abandon *Idas*, although the only reason for keeping it alive now is in the hope (a very remote one) of living specimens being found of *Idas dalli*, E. A. Smith,³ a "Challenger" and "Porcupine" species, and in that shell being found to possess an external ligament. Mr. Edgar A. Smith writes of *I. dalli* that he could not discover "in any of the odd valves (no complete specimen was obtained) any trace either of an internal or external ligament; it is I expect of a very slight character." My valves are in poor condition, and appear granulated on the surface, but that may be owing to a micro-organism, as Mr. Smith describes the shell as "almost destitute of sculpture."

The foregoing three species of *Myrina* have the contour of *Modiolaria*, while *I. dalli* is mytiliform. Gwyn Jeffreys missed the opportunity of describing the animal of *M. argenteus*, and I have failed to make anything that would be reliable out of my resuscitated specimens.

NOTES.

On some large specimens of *Valvata piscinalis*.—I have recently received from the Coneygre Reservoir, near Dudley, Staffordshire, some specimens of *Valvata piscinalis*, Müll., which seem worthy of recording on account of their large size. Three of the largest specimens measured in height 6·9, 6·8, and 6·5 mm., whilst the average of twenty was 6 mm. I at first thought that possibly this large size was due to the great volume of water in which they had lived, but curiously to say, examples of *Limnaea peregra* and *L. globra*, which were found in company with *V. piscinalis* were all very small.—WALTER E. COLLINGE.

Note on *Helix rufescens*.—In 1894, Mr. Collinge recorded the occurrence of *H. rufescens* from Selly Oak and near Olton, Warwickshire (Journ. B'gham. N. H. & Phil. Soc., 1894, vol. i, p. 18). Previous to this, local conchologists doubted the presence of this widely distributed species, in the neighbourhood of Birmingham. The late Mr. G. Sherriff Tye, who had worked the district for very many years, had never met with it. It may therefore be of interest to record that I have taken upwards of a dozen specimens in the Solihull and Knowle district during the last five years. I have also recently examined the late Mr. W. G. Blatch's collection, which is now in my possession, and I find there thirteen specimens labelled "Knowle," collected between 1872 and 1877.—H. WILLOUGHBY ELLIS.

3 "Challenger" Pelecypoda, p. 281, pl. xvi, figs. 10, 10b.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

19TH MEETING, MAY 11TH, 1900.

The President in the Chair.

New member elected : Mr. E. B. Smith.

EXHIBITS.

By Mr. Breeden: Shells of *Azcea tridens* and its variety *crystallina* from Birdlip.

By Mr. Overton: Shells of *Hyalinia draparnaldi* and *H. cellaria* from Tenby; *H. glabra*, *nitidulus*, *purus*, *crystallina*, *excavatus*, *radiatulus*, and *alliaris*, from Sutton; *H. nitidulus*, *purus*, and *alliaris* from Dudley, also the variety *viridula* of the latter species from the same locality. *Vitrina pellucida* from Sutton, and its variety *depressiuscula*. Specimens of *Succinea elegans* and *putris* from Deal, Tenby, and Sutton.

By Mr. Bloomer: Shells of *Paludomus gardneri*, Rve., *undatus*, Rve., *neritoides*, Rve., *loricatus*, Rve., and *Acavus skinneri*, Pfr., all from Ceylon. Various Indian species of *Cyclophorus*.

20TH MEETING, JUNE 8TH, 1900.

The President in the chair.

The following additions to the Library were announced, for which thanks were voted : 26 pamphlets from Mr. Cecil Tye.

PAPER READ.

Note on some large specimens of *Valvata piscinalis*, Müll., by Walter E. Collinge.

EXHIBITS.

By the President: Shells of *Valvata piscinalis*, and of 9 species of British land molluscs presented to the Collection.

By Mr. Bloomer: Shells of *Helix hortensis* from Edge Hills, Warwickshire, presented to the Collection, and *Limnæa stagnalis* from Edgbaston Pool.

By Mr. Overton: Specimens of 41 species of British land and freshwater shells presented to the Collection.

CURRENT LITERATURE.

Pilsbry, H. A. — Tryon's Manual of Conchology, ser. ii, vol. xiii (pts. 49, 50), pp. 1—112. pls. i—xxxiv.

Continuing the *Bulimulidae*, Dr. Pilsbry deals first with *Bothriembryon* (*Liparis*, Martens *nec* Olivier), a genus confined to Western and Southern Australia, with a single species in Tasmania. Passing then to *Placostylus*, he arranges the species in a geographical sequence. The genus is divided into nine sections, of which *Leucocharis* (type *P. pantheri*), *Placocharis* (type *P. macgillivrayi*), and *Callistocharis* (type *P. mallicatus*) are new. In the present parts the species from New Zealand and Lord Howe Island, New Caledonia, New Hebrides, New Guinea, and the Solomon Islands are dealt with, and a commencement made with those from the Viti or Fiji Islands. In considering the New Caledonian fauna, we are pleased to see that the author has endeavoured to restrict the abundance of "specific" names given to slight mutations, and are thoroughly in accord with him that "there cannot be much doubt that too many species have been described from

specimens which represent merely individual or racial variations." With reference to the resemblance of *Placostylus* to *Partula*, noticed by Kobelt and others, Dr. Pilsbry regards it as quite superficial, and does not agree that it indicates the relationship claimed. We should much have liked to see some detailed discussion *re* the affinities of this interesting group, as it is, they are dismissed with the bald statement "The affinities of the group are nearest to *Bothriembryon*." We are not alone in regretting that in a great work of this kind such a feature should be so curtailed or omitted, a shortcoming which has ever characterised the chief monographs.

The following new species and varieties are described: *Bothriembryon physoides* v. *humilis*, *B. gunni* v. *brachysoma*, *Placostylus fibratus*, Marts., v. *strigatus*, *P. heterostylus* (New Hebrides), *P. garretti* (Habitat unknown, Viti group?)—W. E. C.

Sarasin, P. and F.—Die Land-Mollusken von Celebes. Demy 4to, pp. viii + 248, Tfn. 1—31. Wiesbaden: 1899, C. W. Kreidel.

The Drs. Sarasin are to be congratulated on the appearance of the second volume of their studies on the Mollusca of the Celebes. We had occasion to speak very highly of the previous volume treating of the freshwater species, and the present volume is fully equal, if not superior, to it. So far as printing and plates are concerned, no previous work which we can call to mind has reached the standard here attained. Indeed, plate 18, containing twenty coloured figures of the shells of *Xesta*, is, in our opinion, the finest coloured illustration of shells yet produced.

Apart from the great value of this work as a faunistic record, the two most notable features are, the invaluable observations upon the various forms or subspecies of certain molluscs, and the very important chapter treating of the anatomy and development of *Vaginulus*, and the anatomy of the genus *Atopos*.

After deducting the varieties, 170 species are enumerated, of which about one third are new, in addition to many new subspecies and varieties. Of these 140 are endemic, while 37 also occur in districts outside the Celebes. Various species are divided into "forms," the exact value of which varies in different cases; variety and subvariety would perhaps be preferable terms in some cases, whilst in others, distinct geographical races are indicated, e.g., *Obba listeri*, Gray, forms *mongondica*, *tomivica*, *matinangensis*, and *buolica*.

Space will not permit an enumeration of all the new species, but some of the more important may find mention. There are seven new species of slugs described belonging to the following genera: *Vaginulus* 2, *Atopos* 4, *Philomycus* 1. In the *Nanina* group there are many interesting new species of which we may cite *Xesta porcellanica*, *ardens*, *jennemac*, *Hemiplecta weberi*, *wichmanni*, and *braam-morrisi*. Amongst others are *Cyclotus jellesmac* and *bonensis*, *Streptaxis nautilus*, and *celebicus*, a series of "forms" of *Obba listeri*, Gray, and *O. papilla*, Müll. All the new species, &c., are figured, in addition to many others.

To the authors, publisher, and all who have helped to produce this beautiful work, we offer our warmest congratulations.—W. E. C.

Pfeiffer, W.—Die Gattung *Triboniophorus*. Zool. Jahrb. (Abth. f. Morph.), 1900, Bd. xiii, pp. 293—358, Tfn. 17—20.

In 1898 Dr. Plate gave a valuable account of the anatomy of the genus *Janella* and Dr. Pfeiffer has now supplemented this by his study of the genus *Ancitea*, or as he prefers to term it *Triboniophorus*. The specimens selected for this investigation were three from Brisbane, which belong to a species hitherto undescribed, and which is now named *T. brisbanensis*. This species has been carefully compared with *A. graffei*, Humb., and its varieties *schutei*, Kfst., and *krefflii*, Kfst., the three remaining species *A. macdonaldi*, Gray, *A. hirudo*, Fisch., and *A. modesta*, C. and F., do not seem to have received attention.

The chapter on the Literature and Habits is very far from complete. The general anatomy shows a close relationship to *Janella*. The generative organs

approach most nearly to those of *A. krefftii*, Kfst. (cf Zeit. f. wiss. Zool., 1865, Bd. xv, pp. 76—85, T. vi), although there are many important differences.—W. E. C.

Drew, G. A.—Locomotion in *Solenomya* and its relatives. Anat. Anz., 1900, Bd. xvii, pp. 257—266, figs. 1—12.

Dr. Drew gives an interesting account of the movements of burrowing and the musculature involved, in *Nucula*, *Yoldia*, and *Solenomya*. Taking *Yoldia* as an example, the movements and muscular systems being similar in all three genera, the various movements concerned in burrowing are explained, also those of leaping, whilst in *Solenomya* a third method of locomotion is described, that of swimming, which is effected by the expulsion of strong jets of water through the posterior opening of the mantle chamber. Possibly these jets are of use in cleaning the mantle chamber and burrow, and the animal has made use of them secondarily as a means of locomotion.—W. E. C.

Dautzenberg, Ph., et Fischer, H.—Description d'un mollusque nouveau. Bull. Soc. Zool. France, 1899, T. xxiv, pp. 207—209, figs.

The shell here described belongs to an exceedingly interesting mollusc, which is described by Prof. Pelseneer. Large numbers were found attached to a fragment of the beak of a Cephalopod, dredged off the Azores at a depth of 1557 metres, by the "Princess Alice." *Bathysciadium conicum*, n. g. et. sp., is the name given to this mollusc, and it is placed in a new family—*Bathysciadidae*.—W. E. C.

Pelseneer, P.—Note sur l'organisation du genre *Bathysciadium*. Bull. Soc. Zool. France, 1899, T. xxiv, pp. 209—211, figs. 1—3.

Prof. Pelseneer gives an interesting account of the structure and affinities of *B. conicum*. No trace of eyes, gills, or ctenidia were found. The nervous system is similar to that of the *Patellidae*. There are two otocysts, each containing a single spherical otolith. The radula is very long and has 1 median, 3 lateral, and 1 marginal tooth on each side. The heart has a single auricle. There are two nephridia, that on the left side being much larger than is usual in the *Patellidae*. The species is regarded as hermaphrodite, but so exceptional a condition requires further confirmation. There is a long cephalic appendage, which is thought to be a copulatory organ. While possessing the general characters of the *Patellidae*, it is distinguished from all the existing families by the remarkable otocysts, the hermaphrodite condition, and the form of the radula.—W. E. C.

Melville, J. Cosmo.—A Revision of the Textile Cones, with description of *C. cholmondeleyi*, n.sp. Journ. Conch., 1900, vol. ix, pp. 303—311, 1 fig.

No one is more competent than Mr. Melville to treat of the subgenus *Cylinder*, Mont., and in the paper before us he gives a very useful revision of the 45 known forms. *C. cholmondeleyi* is described as a new species, which hitherto has been confused with *C. pyramidalis*, Lam. In its markings it somewhat resembles *C. corbula*, Sby., or *C. euetrios*, Sby. The type is in the Manchester Museum.—W. E. C.

Sykes, E. R.—Fauna Hawaiianis, 1900, vol. ii. Mollusca. With Intercalations on Anatomy by Lt.-Col. Godwin-Austen. pp. 271—412, pls. xi—xii.

Mr. Sykes has here given an extremely valuable account of the Land and Fresh-water Mollusca of the Hawaiian Islands. He is of opinion that the fauna is nearly related to that of the Polynesian Islands, showing little trace of any continental influence, Asiatic or American. In nearly all cases the species are confined to one island. By a series of tables it is shown that 50 species are peculiar to Kauai, 175 to Oahu, 44 to Molokai, 25 to Lanai, 64 to Maui, and 37 to Hawaii.

Turning to the Systematic portion, 476 species and 30 varieties are enumerated. *Godwinia* is a new genus proposed for the *Vitrina caperata* of Gould. *Philonesia*,

a new genus with the *Microcystis baldwini*, Ancey, as the type. *Achatinella* (*Partulina*) *confusa*, a new name for *A. physa*, Newcomb. *Amastrella*, a new subgenus of *Amastra*, type *A. angulosa*, Pease. *Kauaia*, a new subgeneric name for *Carinella*, Pfr., 1875, the latter having been used by Sowerby in 1839. The new species are: *Achatinella* (*Achatinellastrum*) *wailuensis*, *Perdicella fulgurans*, *Leptachatina arborea*, *conicoides*, *convexiuscula*, *emerita*, *imitatrix*, *konaensis*, *supracostata*, *vana*, *Auricellula perkinsi*, *Tornatellina compacta*, *confusa*, *cylindrica*, *perkinsi*, *trochoides*, *Succinea protracta*, and *Ancylus sharpi*.

A very complete bibliography, enumerating the titles of 178 works is given, and an exceedingly useful list of named forms, which are placed in the present work as varieties or synonyms.—W. E. C.

Collinge, Walter E.—Report on the Slugs. A. Willey's Zoological Results, 1899 [1900], pt. iv, pp. 429—438, pls. xl—xli.

The new species are *Veronicella willeyi*, from Lifu, Loyalty Islands, and *V. brunnea* from Esafate, New Hebrides. Two new varieties—*albida* and *fuscolutescens*—of *Ancitella berghii*, Plate, are described from Karavia, New Britain.

Ancitella hirudo, P. Fisch., is recorded from Lifu, and *V. leydigii*, Simr., and *V. hedleyi*, Simr., both from Esafate.

Pruvot, G.—Sur deux Néoméniens nouveaux de la Méditerranée. Arch. Zool. exp. et gén., 1899, T. 7 (s3), pp. 461—509, pls. xii—xiv.

Professor Pruvot describes two new genera and species of unusual interest. The first, *Stylomenia salvatori* is regarded as a transitional form, and its structure, which is treated of at some length, indicates many primitive characters. Like the genus *Isomenia* it finds its natural position in a group between the *Proneomeniidae* on the one hand and the *Neomeniidae* on the other. The second form, *Strophomenia laevis* is probably derived from *Rhopalomenia aglaophenia*, Kow. et Mar., or some closely allied form. Its actual affinities, however, are with *Pruvotia sopita*, Pr., and perhaps a *Notomenia*, described by Thiele, from Australia. In any case it represents a degenerate Neomenian, modified under the influence of parasitism.

Figures of both forms are given, in addition to many others, illustrating the structure.—W. E. C.

Williamson, M. Burton.—Estivation of *Epiphragmophora traskii* in Southern California. Naut., 1900, vol. xiv, pp. 13—15.

Unlike their congeners of the eastern states, which hibernate during the winter months, the helices in southern California exhibit the greatest activity during this period, hibernating during the summer. "The reason for this is that the food supply is plentiful in the winter when the warm rains prevail; and during the summer months the arid condition of the foot-hills, the habitat of these quiet creatures, made the aestivation of snails a necessity, a question of economy, an adjustment of demand and supply. In process of time the necessity for aestivation rather than hibernation became a habit."—W. E. C.

Baker, F. C.—A Revision of the *Physæ* of Northeastern Illinois. Naut., 1900, vol. xiv, pp. 16—24.

This is a useful and interesting piece of work. The following species, &c. are described and figured: *P. heterostrophus*, Say, *P. sayii*, Tappan, *P. gyrina*, Say, and var. *elliptica*, Lea, and *P. integra*, Hald. Some interesting observations on *P. gyrina* are given, from which we quote the following: "It is very interesting to watch a number of *Physæ* in an aquarium; as they are crawling along the bottom, one will be seen to rise suddenly to the top of the water and move along with the foot applied to the surface, the shell hanging down. Again, they may be seen descending, suspended by a thin thread of mucus. When the animal rises suddenly, the branchial cavity opens with a faint clicking sound, probably due to

the pressure of air in the lung. This species frequently inhabits water so cold as the freezing point, and may be observed in winter gliding along the bottom of a pond when the surface is frozen. The eggs are deposited on stones, the under side of sticks, etc., and are composed of large, glairy, transparent masses. * * * The egg masses measured 20 by 4 mill., and contained from 120 to 200 eggs."—W. E. C.

Donald, J.—On some recent Gastropoda referred to the family *Turritellidae* and their supposed relationship to the *Murchisoniidae*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 47—55, pl. v.

The object of Miss Donald's paper is to draw special attention to the shells of "some recent Gastropoda which bear considerable resemblance to certain fossil forms referred to the family *Murchisoniidae*," in the hope that the animals as well as the shells may be studied, with the view of learning more of their affinities.

The genus *Murchisonia* is especially characterised by the possession on the outer lip of a deep narrow slit, many other genera show the same character, but otherwise differ greatly from the shells of the above mentioned genus, excepting seven species of *Turritella* and four new species which are here described under a new section *Colpospira*, with *Turritella runcinata*, Watson, as the type. Until the animal is known, the author thinks it advisable to regard *Colpospira* as a section of *Turritella*. All the species of this group have been dredged off the coasts of Australia, Tasmania, and New Zealand. The new species are *T. (Colpospira) smithiana*, *crenulata*, *godffroyana*, *quadrata* and a variety *scitula*, nov. of the last named species. In *T. quadrata* the sinus is much broader and shallower; should it later be proved that the animal shows structural differences, Miss Donald suggests the name of *Platycolpus* for a new section for its reception.

It is to be hoped that sufficient material of some of these species for anatomical investigation may soon be obtained.—W. E. C.

Babor, J. F.—Mittheilungen über Nacktschnecken in der Sammlung des K. K. naturhistorischen Hofmuseum. Ann. d. K. K. naturhist. Hofmuseums, Wien, 1900, Bd. xv, pp. 95—102.

Two new species are described, *Ariolimar steindachneri*, from Puget Sound, North America, and *Atopos (Padangia, subg. n.) schildii*, from Padang, Sumatra.

Babor, J. F.—Über die Nacktschnecken der Grazer Umgegend. Verhandl. d. D. Zool. Gesell., 1900, pp. 148—150.

Randles, W. B.—On the Anatomy of *Turritella communis*, Risso. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 56—65, pl. vi.

In view of the recent discussions upon, and the suggested affinities between, certain species of *Turritella* and the extinct genus *Murchisonia*, Mr. Randles' account of the anatomy of *T. communis* is very welcome. After a general description of the alimentary canal, radula, generative organs, the nephridium, gill, osphradium, and nervous system, the author concludes that though *Turritella* is in no way particularly specialised, it can hardly be regarded as approaching a primitive type; some few characters are undoubtedly primitive, such, for example, as the presence of an epipodium, the fringed and papillated mantle, and in some species the presence of otoconia. The aggregate characters, however, especially as regards the nervous system, indicate that *Turritella* is a fairly highly organised monotocardian, and not at all approaching in structure the Diotocardia.—W. E. C.

Vayssière, A.—Description de deux espèces de Pleurobranchidés. Journ. de Conchyl., 1900, vol. xlviii, pp. 8—11.

The new species are *Oscaniopsis omboinei* and *Pleurobranchaea capensis*.

Kennard, A. S., and Woodward, B. B.—The Pleistocene non-marine Mollusca of Ilford. Proc. Geol. Assoc., 1900, vol. xvi, pp. 282—286.

Buddicom, R. A.—The Land and Freshwater Molluscs of Chnrch Stretton. pp. 16, and plate. Shrewsbury: 1900.

Records 42 species, with notes on the distribution, habits, &c.

Cockerell, T. D. A.—A new *Philomycus*. Naut., 1900, vol. xiv, p. 59.

P. secretus, n. sp. "Length (in alcohol) 12 mm. Mantle very dark grey, with numerous small black spots, best seen at the sides. Body pallid, sole whitish with an ochereous tint. Jaw light yellow, arched, with five strong ribs in the middle, nearly the outer thirds being ribless. Teeth 9—11—13—1—13—11—9. The side cusps on both centrals and laterals are very small. Penis-sac as Binney describes for *P. hemphilli*.

Hab.—Roan Mtn., Mitchell Co., Nth. Carolina (A. G. Wetherby)."

Prof. Cockerell's new species differs from *P. hemphilli*, W. G. Binn., which it resembles by the characters of its jaws, "mainly in being only half the size." We hope, at an early date, the author will figure and describe the animal in greater detail, and give some account of the anatomy.—W. E. C.

Sykes, E. R.—The Zoological Record, London: 1900. Record vii, Mollusca, pp. 1—87.

With the increase in the number of workers and their writings this publication yearly becomes more and more indispensable. The present part chronicles papers dated from 1896 to 1899, although it is not always clear what the date is that any given paper bears, for, as we have previously pointed out, the year of publication is seldom given. For a work of this kind it is surprising how few slips the Recorder has made, we note, however, on p. 41, under Java, that *Microparmarion javanica*, n. sp., are omitted. The number of papers referred to under the "Systematic" portion, which do not find mention under "Titles," is, we regret to say, largely on the increase.

Hitherto the Record has taken no notice of abstracts and critical reviews of papers given in the "Journal of the Royal Microscopical Society," this, and other publications; whilst their inclusion would add largely to the number of pages, it would nevertheless make the Record more complete, and we venture to direct the Recorders attention to the consideration of this matter.—W. E. C.

Sturany, R.—Lamellibranchiaten des Rothen Meeres. Denk. K. Akad. Wiss. Wien, 1899, Bd. lxi, pp. 255—295, Tfn. i—vii.

In all 148 species were obtained of which 20 are new, these belong to the following genera: *Solecurtus* 1, *Lyonsia* 1, *Cuspidaria* 4, *Pseudoneacra* (n. g.) 1, *Raëla* 1, *Cardita* 1, *Limopsis* 1, *Amussium* 2, *Gastrochaena* 3, *Tellina* 1, *Chione* 1, *Diplodontia* 1, *Scintilla* 2. All the new species are liberally illustrated.—W. E. C.

Jensen, A. S.—Studier over nordiske Mollusker. I. *Mya*. Særtryk af Vidensk. Meddel. fra den naturh. Foren. i Kbhvn., 1900, pp. 133—158.

Jensen, A. S.—Om Leoninger af Grundtvandsdyr paa store Havdyb mellem Jan Mayen og Island. Ibid., pp. 229—239.

Rogers, Thomas.—The Eggs of the Kerry Slug, *Geomalacus maculosus*, Allman. Irish. Nat., 1900, vol. ix, pp. 168—170, pt. pl. v.

Nichols, A. R.—A List of the Marine Mollusca of Ireland. Proc. Roy. Irish Acad., 1900 (3), vol. v, pp. 477—662.

Byrnes, E. F.—The Maturation and Fertilisation of the Eggs of *Limax* [*Agriolimax*] *agrestis*, L. Journ. Morph., 1899, vol. xvi, pp. 201—236, pls. xi, xii.

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NOTES ON SOME FURTHER MALFORMED
SPECIMENS OF ANODONTA CYGNEA, L.

By H. H. BLOOMER.

SINCE my paper appeared in the June number of this Journal¹ describing certain malformations in the animal and shell of *Anodonta cygnea*, L., I have received from Mr. S. P. Bolton two more specimens, which, while exhibiting some similar malformations present others of an interesting character.

In the first specimen the left valve is fractured just below the umbo, and from here an indentation extends nearly to the ventral edge, while opposite to it, the right valve though not showing any sign of fracture is also slightly indentated, but in this case the indentation extends for about only half the distance.

On examining the animal I found that both the right and left mantle lobes were thickened along the part adjacent to the injury, the left lobe more so than the right one. The gills on the right side are normal, but those on the left have both received considerable injury, curious to say the inner one more than the outer one. A transverse section of the animal in the region of the injury (fig. 1), shows a fusion of the outer side of the left outer gill with the left mantle lobe, and a slight fusion of the outer side of the left inner gill with the inner

1 Journ. of Malac., 1900, vol. vii, pp. 136—138, pl. vii.

side of the left outer gill, very little remaining of the left inner gill. The left outer supra-branchial canal (fig. 1. sc) is considerably larger than the right outer one.

In the second specimen there is a large fracture of the right valve, which at the time it occurred evidently forced in a large mass of the valve. The animal afterwards rebuilt the shell beneath the fracture, the new portion consisting of the calcareous and nacreous layers only. On the inner side of the right valve there has arisen a thin ridge of shell 13 mm. long, and 7 mm. high, which passes in a posterior direction and is set at right angles to the valve. Dorsally there is a second, much smaller ridge, running parallel with the former one. The animal exhibits very few signs of injury. The ridges, mentioned above, have penetrated the posterior adductor muscle, the right portion of which has spread out and become forced into a more anterior position than the left portion, thus deforming the right kidney. Other than this the animal appears quite normal.

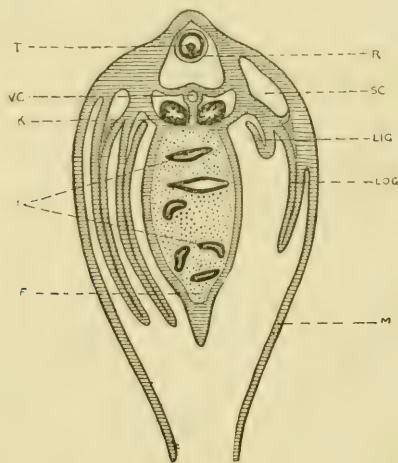


Fig. 1.—Transverse section of *Anodonta cygnea*, L.

F. foot, I. intestine, K. kidney, L.I.G. left inner gill L.O.G. left outer gill M. mantle, P. pericardial cavity, R. rectum, S.C. left outer supra-branchial canal, T. typhlosole, V.C. vena cava.

DESCRIPTION OF A NEW SPECIES OF VERONICELLA FROM THE FIJI ISLANDS.

By WALTER E. COLLINGS,

The University, Birmingham.

SOME short time ago Prof. Gustave Gilson sent to me for identification, a specimen of *Veronicella* collected by him in the Fiji Islands. Later he has very kindly placed further material in my hands for anatomical investigation. The species is a new one, and I am now giving a description of it, the account of its internal structure will appear elsewhere at a later date.

I have much pleasure in associating with this new form the name of Prof. Gilson.

Veronicella gilsoni, n. sp.

Like most species of this genus, there is little to distinguish it by the external appearance. Dorsally it is a dirty yellow colour with small, irregularly distributed, blackish blotches, and finely granulated. The perinotum is finely indented on its marginal edge, and is a brighter yellow colour than the notum; the hypnotum is a greenish-yellow colour. Foot-sole yellowish-brown, marked by a series of fine, regular, transverse lines.

Length (in alcohol) 23·5 mm.; foot-sole 2·5 mm. broad; hypnotum 4·5 mm. broad; female generative orifice situated on the right side 2 mm. from the foot-sole, 11 mm. from the right lower tentacle, and 9·5 mm. from the posterior end of the body.

Hab.—Nabukaluka, River Waidina, Viti Levu.

Type.—In my collection.

NOTE ON THE GAEOTIS DOUVILLEI OF DE MORGAN.

By WALTER E. COLLINGS,

The University, Birmingham.

IN a recent part of the "Manual of Conchology" (1899, vol. xii, p. 228) Dr. Pilsbry, in treating of the Genus *Gaeotis* writes "*Gaeotis douvillei* de Morgan from the summit of Mount Tchabang, Perak, is doubtless a *Girasia* allied to *G. (Africaria) ater*, Godwin-Austen." On seeing this statement Professor Cockerell wrote me suggesting that I should

look up the original description and figure, and see if it differed at all from *Pseudautestia siamensis*, Ckll.¹ As the Asiatic slug-like molluscs are so very imperfectly understood, the subject is perhaps worthy of a short note.

De Morgan's description² is as follows:

"*Animal*.—Limaciforme allongé, d'un brun clair, orné de chaque côté de deux bandes longitudinales noires.

Coquille.—Unguiliforme, aplatie, fragile, très mince, transparente, composée de deux demi-tours de spire, la partie inférieure manquant, le dernier est très grande, stries d'accroissement très fines.

Dimensions. Long. 9 mm.; larg. 5.5 mm."

This is accompanied by a figure showing a *Peltella*-like slug. Both the description and figure are poor, and were it not for the latter, it would be very difficult to say to what genus this species belonged. Although poor, the figure is sufficiently clear to show that the species is closely allied to *Peltella*, in fact, is in all probability rightly assigned to the genus *Gaeotis*, I am therefore at a loss to understand Dr. Pilsbry's statement "doubtless a *Girasia*."

With reference to *Pseudautestia siamensis*, Ckll., the type of which is in the British Museum collection; through the kindness of Mr. Edgar A. Smith, I have recently had an opportunity of examining this. There are two examples, and judging from the external appearance I should say they both belong to the genus *Parmarion* and are probably allied to *P. pupillaris*, Humb., if they are not young examples of that species. It is, however, very difficult to separate these slug-like molluscs on their external characters, and possibly *P. siamensis* would on dissection prove to be a valid species.

HELIX LAPICIDA, L., MONS. SINISTRORSUM, NOV.?

By F. J. PARTRIDGE.

WHILST staying at Lynton, North Devon, last summer I was fortunate enough to find a full grown sinistral example of *Helix lapicida*, L. There is a large colony of the type here inhabiting a low wall, together with the varieties *ecarinata* and *albina*. After a shower of rain they come out, covering the wall and adjacent rocks in countless profusion; and although I have collected here for some years, and taken many

¹ Ann. and Mag. N. H., 1891, p. 107.

² Bull. Soc. Zool. France, 1885, x, p. 388, pl. 8, Fig. 9.

forms of this species peculiar to the district, I have never before been fortunate enough to find a sinistral monstrosity.

The shell and animal seem typical in sculpture, form, and colour, having the peculiar looking glass appearance which seems to be characteristic of such shells as are typically dextral.

In looking up the literature upon this species I have failed to find any mention of a sinistrorse monstrosity, possibly foreign literature may contain such a record, and if so I should be glad of the reference.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

21ST MEETING, SEPTEMBER 14TH, 1900.

The President in the chair.

Several donations to the Library were announced, and thanks voted to the donors.

EXHIBITS.

By Mr. Overton: Marine shells from Bridlington.

By Mr. Partridge: *Limax maximus* v. *cinereo-niger*, from Horner, Somersetshire; *Unio margaritifera* from the River Taw, *Helix hortensis*, *H. lapicida* m. *sinistrorsum*, nov. from Lynton, Nth Devon: and *Acarus haeratosoma* and *Cyclophorus ceylanicus* from Ceylon.

By Mr. Breeden: Shells of various local land and freshwater shells.

By the President: Animal of *Capulus hungaricus* from Mumble's Head.

22ND MEETING, SEPTEMBER 14TH, 1900.

The President in the chair.

The evening was devoted to a study of *Helix aspersa*. The President gave a short account of the life-history, distribution, and variation of the species illustrated by numerous specimens.

Mr. Willoughby Ellis exhibited about 300 specimens, and Mr. Breeden a smaller collection. Specimens of *Helix rufescens* from Knowle, Warwickshire, were also exhibited by Mr. Ellis.

23RD MEETING, NOVEMBER 9TH, 1900.

The President in the chair.

PAPERS READ.

1. On the Anatomy of Certain Agnathous Pulmonate Molluscs.

By Walter E. Collinge.

2. On some further malformed specimens of *Anodonta cygnea*, L.

By H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Specimens in illustration of his paper, also shells of *Helix nemoralis*. A short account of the nomenclature, variation and distribution of *H. nemoralis* was read, the remainder of the evening being devoted to the examination of the various collections of this species contributed by the President, and Messrs. Bloomer, Breeden, and Overton.

CURRENT LITERATURE.

Pilsbry, Henry A.—Tryon's Manual of Conchology, ser. ii, vol. xiii (pt. 51), pp. 113—176, pls. 35—48. Philadelphia: Academy of Natural Sciences.

The Fiji species of *Placostylus* are here completed, and the subgenus *Diplo-morpha*, Anc., treated of. *P. coxiana*, New Hebrides, is a new species. The author then gives a series of descriptions, previously omitted, of various Australian Bulimoid *Helicidae*.

The larger portion of the present part is devoted to the genus *Amphidromus*, Alb. Dr. Pilsbry concludes from the researches of Semper, Wiegmann and Jacobi, that the genus does not belong to the *Bulimulidae*, but to the *Ephippallogona* group of the *Helicidae*. The genus is a difficult one, and will probably remain so for some time to come, in fact until our knowledge of the specific anatomical characters is more complete. Dr. Pilsbry groups the species in 20 groups, agreeing in part with those of Fulton. Seven of these groups are dealt with in the present part, and keys to the shell-characters are given in most cases.—W. E. C.

Bergh, R.—Ergebnisse einer Reise nach dem Pacific (Schauinsland 1896—1897). Die Opisthobranchier. Zool. Jahrb. (Abth. f. Syst.) 1900, Bd. 13, pp. 207—246, T. 19—21.

Dr. Bergh here describes the Opisthobranchs collected by Prof. Schauinsland in 1896—97. The new forms are *Chelidonura hirundinina*, Q. and G., v. *elegans*, Bgh. (n. sp.), *Archidoris nyctea*, *Acolidiella drusilla*, *A. faustina*, and *Samla annuligera*, n. g. et sp. The new genus belongs to the *Flabellinidae*, and is characterised by the beautiful perfoliate rhinophoria, a rounded anterior margin to the foot, a triseriate radula, with a denticulate anterior margin to the lateral teeth, and an unarmed penis.—W. E. C.

Smith, J. Perrin.—Larval Stages of *Schlenbachia*. Journ. Morph., 1899, vol. xvi, pp. 237—268, pls. A—E.

Mr. Perrin Smith continues his very valuable studies on the ontogeny of the Ammonites. A short time ago he gave a very careful account of the development of the genera *Lptoceras* and *Phylloceras*, and in the present paper the larval stages of *Schlenbachia oregonensis* are dealt with. The species is a remarkable one, in that its descent is so very clearly shown through its ontogeny. In its development it repeats in the first five septa the history of *Anarcestes*, *Parodoceras*, and *Prionoceras*; then for about a single whorl it is a *Glyphioceras*; in the next one and a quarter a *Gastrioceras*; then for a little more than one-quarter of a revolution a *Paraloceras*, the goniatite history terminating at two and five-eighths coils. It now develops a keel, and resembles one of the simpler Permian and Lower Triassic ammonites. Then follow the aneanic, metaneanic, and paraneanic stages. With the appearance of the sixth whorl, the shell commences to take on its own proper characters, and is then in the ephebic stage. Thus it will be seen, the larval stages may be compared with Paleozoic genera. This interesting form offers a striking illustration of the law of the acceleration of development.

With the advance of the stage, the author finds that there is a great increase in the individual variation, this being still greater with the acquirement of adult characters, so that were it not for the transitions between the varieties, one would feel inclined to make several species out of one.—W. E. C.

Smith, J. Perrin.—The Development and Phylogeny of *Placenticeras*. Proc. Cal. Acad. Sci. (3rd ser.), Geology, 1900, vol. i, pp. 181—240, pls. xxiv—xxviii.

This paper is prefaced by an interesting "Introduction" on the law of tachy-genesis. The author then devotes a section to a discussion upon the affinities of *Placenticeras* and *Hoplites* and gives a phylogenic table of *Placenticeras* and associated genera, which must both prove of value to all students of fossil Cephalopoda.

P. pacificum, n. sp. is nautiloid in septa, but ammonoid in its calcareous protoconch in the earliest larval stage. The middle larval stage shows a form not unlike the Paleozoic *Glyphioceras*; while the last larval stage is analogous to *Nannites*, a Mesozoic genus. In the adolescent period it passes through the following stages: first one corresponding to *Cymbites* or some *Cymbites*-like form, then to some ægoceran genus of Upper Triassic or Lower Jurassic age, then to one of the early perisphinctoid genera, then to *Cosmoceras* of the Jura, and lastly to *Hoplites*. Thus by ontogenic study it is shown that *Placentoceras* developed out of *Hoplites*, and must therefore be placed with the last mentioned group under the *Stephanoceratidae* and not *Amaltheidae*, as is usual in nearly all text-books.

A parallel study of the ontogeny of *P. pacificum* and *P. californicum* only serves to show that the results must be interpreted with caution, the differences being largely due to unequal acceleration of characters.

In this and the previous paper we cannot attempt to do more than very briefly indicate the line of ontogenic research, to be fully appreciated, the complete papers must be carefully read, and this all malacologists should do.—W. E. C.

Sturany, R.—W. A. Obrutschew's Mollusken-Ausbeute aus Hochasien. Denk. K. Akad. Wiss. Wien, 1900, Bd. lxx, pp. 17—48, Tfn. i—iv.

Dr. Sturany in a very welcome contribution, enumerates 59 species and 4 varieties of which the following are new: *Plectotropis comata*, *Stilpnodiscus euphyes*, *Metodontia griphodes*, *Cathaica obrutschewi*, *C. perversa*, *Platypetasus obrutschewi*, ? *Satsuma kutupaensis*, *Buliminus schypaensis*, *B. obrutschewi*, *B. diaprepes*, *B. teres*, *B. æcerampelinus* and var. *thryptica*, *B. commensalis*, *B. ottonis*, *B. asaphes* and var. *brevior*, *B. amphidoxus*, *B. interstratus*, *B. euonymus*, *Serina cathaica*, Grdlr., var. *egressa*, *Pupopsis dissociabilis*, *P. polustrepta*, *P. paraplesia*, *Opeas schensiense*, *Planorbis exarescens*, *P. neumayri*, *Valvata kukunorica*, *Corbicula obrutschewi*, *C. methoria*, and *Unio tschiliensis*. All the new forms are figured, in addition to 9 previously described by Dr. von Möllendorff. A very useful Bibliography, enumerating upwards of 100 papers, completes this interesting memoir.

Sturany, R.—Diagnosen neuer Gastropoden aus dem Rothen Meere. Anz. K. Akad. Wiss. Wien, 1900, Nr. xvii, pp. 1—4.

The new species are *Fusus bifrons*, *Nassa thaumasia*, *N. steindachneri*, *N. zesta*, *N. munda*, *N. lathraia*, *N. stiphra*, and *N. sporadica*.

Hedley, C.—Studies on Australian Mollusca. Pt. i. Proc. Linn. Soc. N.S.W., 1900, pp. 87—100, pls. iii—iv, and 4 figs. in text.

Mr. Hedley hopes in this series of papers to “fix by illustration the identity of such unfigured species as” he can obtain, and to note the occurrence of species on the coast of N. S. Wales not previously recorded. In the present part he treats of the following: *Sirius*, n. gen., type *Raulinia badia*, T.-Woods. The author agrees with Tate in considering *Raulinia* indistinguishable from the prior *Isapsis*, H. and A. Adams. *Fossarus sydneyensis*, and *Couthouryia aculeata*. Menon a new genus of *Eulimidae*, with *M. anceps* as the type. *Seila attenuata*, and *Teinostoma orbitum*. In addition to the above mentioned new species, figures of the following are also given: *Stylifer lodderae*, Pelt., *Zeidora tasmanica*, Bedd., *Amauropsis moerchi*, Ad. and Ang., *Lodderia minima*, T.-Woods, *Fissuridea lineata*, Sby., and the animal of *Notarchus glaucus*, Chsm.

Simroth, H.—Ueber einige Nacktschnecken von Montenegro and Corsica. Nachr. d. Deutsch. Malak. Gesell., 1900, pp. 77—95.

The following are described as new: *Limax wohlberedti*, *L. wolterstorffi*, *L. obscurus*, *Agriolimax corsicus*, *Amalia dalmatini*, *Am. montenegrina*. The absence of any figures considerably detracts from the value of an otherwise very interesting paper.—W. E. C.

Mead, A. D.—Observations on the soft-shell clam. 30th Ann. Rpt. Commis. Inland Fisheries, U.S.A., 1900, pp. 1—25, pls. i—xi.

The author here gives some interesting details relating to the life history, &c. of the soft-shell clam. The eggs are exceedingly minute and the egg-laying period probably extends over May and June. They are extruded in large numbers, and in a short time after fertilisation, develop into minute free swimming forms not at all like the adults. In this condition they live for several days and are carried away by the tides, they then settle down and attach themselves to some object, a stone or a piece of sea-weed. The experiments of transplanting seem to prove that the rate of growth is more rapid than is usually supposed, the most rapid growth taking place where the molluscs are under the water most of the time. Certain facts strongly indicate that they breed during the first year of their life, although the age at which they reach sexual maturity has not been definitely ascertained.

Pilsbry, Henry A.—*Metostracon*, a new slug-like genus of dart-bearing *Helicidae*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 24—30, pl. iii.

In this interesting paper Dr. Pilsbry describes a slug-like mollusc derived from the true '*Helix*' stock, to which the name *Metostracon mimia*, n. g. et sp. is given.

From the anatomical features a relationship to *Xanthonyx* is unmistakably indicated. Upon the affinities of these two genera the author makes some valuable observations. At first sight these genera recall the external form of certain *Arionidae*—*Binnia* and *Hemphillia*, the resemblance, however, is only superficial. The *Limacidae* and *Philomacidae* are obviously very different, whilst the slug-like genera of the *Bulinacidae* are clearly bulimuline. It would seem therefore that no known group of slugs will receive *Metostracon* and *Xanthonyx*; but a group of the *Helicidae* known as the *Belogona* Euadenia, agrees in all the important characters. The nearest allies then are apparently the genera *Epiphragmophora* and *Cepolis*, the four genera practically agreeing in all the important anatomical characters, excepting those correlated with the degeneration of the shell.

Whether *Xanthonyx* has an ally in the genus *Cryptostracon*, W. G. Binn., at present remains doubtful; this latter genus, the author thinks, may be a more advanced member of a sub-family which would contain the former genus and the new one here described. Seeing that it is by no means certain that these three genera have arisen from the same genus of Helicoid *Belogona*, the author refrains from so grouping them; certain anatomical features suggesting parallelism rather than a common phylogeny. This latter view, will, we think, be endorsed by malacologists.—W. E. C.

Pilsbry, Henry A.—Note on the Anatomy of the Helicoid genus *Ashmunella*. Proc. Acad. Nat. Sci. Phila., 1900, pp. 107—109, figs. 1—3.

An examination of the generative organs of *A. thomsoniana*, Anc., *A. porterae*, Pils. and Ckll., and *A. hyporhyssa*, Ckll., fully confirms the anatomical characters ascribed to this genus by the author in 1899. It is very distinct from *Polygyra*, and possibly related to the New Mexican species referred to the genus *Epiphragmophora*, which Dr. Pilsbry has examined. Judging from an immature example of *E. hachitana*, he thinks, a series of forms strikingly divergent in the reproductive organs from the Californian forms may be found here.

Pilsbry, Henry A.—Notices of new Japanese Land snails. Proc. Acad. Nat. Sci. Phila., 1900, pp. 381—384.

A Key to the Japanese species of *Alycaeus* is given and the following new species and varieties described: *Diplommatina pusilla* v. *omiensis*, *Macrochlamys micrograpta*, *Kaliella multivolvis*, *Vitrea harimensis*, *Georissa japonica*.

Pilsbry, Henry A.—New South American Land snails. Proc. Acad. Nat. Sci. Phila., 1900, pp. 385—394, pls. xi, xii.

The following are new: *Happia iheringi*, *Polygyratia sargenti*, *P. affinis*, *P.*

stenostrepta v. *declinata* *Epiphrag. oresigena*, Orb., v. *bernardius*, v. Iher., *Strophocheilus oblongus*, Müll., v. *sanctae-pauli*, v. Iher. and Pils., *S. paranaguensis*, Pils. and v. Iher., *Bulimulus steerei*, *B. haematospira*, *Helicina iguapensis*, and *H. inaequistriata*.

Ihering, H. von.—Description of a New *Strophocheilus*. Proc. Ac. Nat. Sci. Phila., 1900, p. 394, pl. xi, fig. 4.

S. pilsbryi from Sao Paulo, Brazil, allied to *S. rhodocheilus*, Rve.

Ihering, H. von.—Os Caracões do genero *Solaropsis*. Rev. do Mus. Paulista, 1900, vol. iv, pp. 539—549, figs. 1—12.

Dr. von Ihering describes the jaw, radula, and generative organs of *S. feisthameli*, Hupé, and *Psadura derbyi*, n. sp. *S. pilsbryi* and *S. bachi* are also new species. A key to the classification of the Brazilian species of *Solaropsis* is given, and a short account of their geographical distribution.

Stubbs, Arthur G.—The Land and Freshwater Shells of Tenby. Journ. Conch., 1900, vol. ix, pp. 321—28, 358—65.

The author records 70 species, 11 varieties, and numerous monstrosities. *H. aspersa* v. *rufula-zonata*, and *H. virgata* v. *coarctata* are two new varieties. In addition to cataloguing the various forms, many interesting notes are given, e.g. the range of distribution of *H. pisana* in the neighbourhood, and various modifications of the shell of this species; a curious habitat of *Ancylus fluvialtilis*; and various notes on the variation, etc.

Sykes, E. R.—On the genus *Aeacus*, Mont. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 114—115.

The author recognises seven species, possibly *A. prosperus*, Albers, may prove to be only a variety of *A. haemastomus*, L. The *A. poleii* of Collett is regarded as only a white-lipped variety of *A. waltoni*, Rve.

Sykes, E. R.—On *Desponca cinnamomea*, n. sp., and type of a new subgenus *Chersodesponca*, with notes on some allied forms. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 136—138, 3 figs.

Sykes, E. R.—Notes on the non-marine Mollusca of Norfolk and Phillip Islands, with descriptions of new species. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 139—147, pl. xiii, and figs. i—iii.

The new species, etc., are: *Microcystis nux*, *M. castaneocincta*, *Trochonanina platysoma*, *Fretum*, nom. nov. for *Eurypus*, Semp., preoccupied, *F. suteri*, *F. grayi*, *Modiola imitatrix*, *Situla macgillivrayi*, *Vertigo norfolkensis*, *Omphalotropis brenchleyi*, *O. suteri*, *Paludestrina norfolkensis*. In addition to figures of all the new species, some drawings by Mr. Hedley, of species very briefly described by Cox and hitherto unfigured, are given; these are *Charopa (?) depsta*, Cox, *quintalae*, Cox, and *patescens*, Cox.

Gude, G. K.—Description of a new Species of *Plectopylis*, from Tonkin. Ann. Mag. N.H., 1900 (s. 7), vol. v, p. 313.

P. lepida, n. sp. Type in author's collection.

Gude, G. K.—Descriptions of new Species of Japanese Land Shells. Ann. Mag. N.H., 1900 (s. 7), vol. vi, pp. 398—401, 453—456.

The new species are: *Arnouldia ceratodes*, *A. nanodes*, *Crystallus sulcatus*, *C. velatus*, *Microcystis hirasci*, *Trishoplita cretacea*, *Plectotropis conica*, *Kaliella elata*, *K. crenulata*, *K. pagoduloides*, *Pyramidula* (s. s.) *pretiosa*, *Trishoplita dacostae*, *Ganesella tosana*, *Eulota (Euhadra) grata*, and var. nov. *zonata*. Types all in author's collection. We hope Mr. Gude will give figures of these.

Godfrey, R.—*Scpiola rondeletii* (Leach) in the Firth of Forth. Ann. Scott. Nat. Hist., 1900, p. 125.

Kellogg, J. L.—The Ciliary Mechanism in the Branchial Chamber of the Pelecypoda. Science, N.S. vol. xi, pp. 172—173.

Pilsbry, Henry A.—Note on the Australian *Pupidae*. Proc. Acad. Nat. Sci. Phila., 1900, pp. 426—430, figs. 1—5.

Four genera of this family are represented, of which one, *Cylindrovertilla*, is known from Australia and New Caledonia only, the remaining three—*Pupoides*, *Pupa* and *Bifidaria*—being widely distributed. So far as their Australian distribution is concerned, they agree with the Epiphallogonous Helices and probably reached Australia by the same land connection and at the same time, from the northward.

Pilsbry, Henry A.—Note on Polynesian and East Indian *Pupidae*. Proc. Acad. Nat. Sci. Phila., 1900, pp. 431—433.

Dr. Pilsbry removes the Madeiran group *Staurodon* of Lowe from the nomenclature of Oriental *Pupidae*. In referring East Indian forms to this group undue weight has, he thinks, been given to a mere analogy. Four groups are recognised, viz. *Bifidaria*, Sturki, *Cylindrovertilla*, Bugr., *Costigo*, Bugr., and *Nesopupa*, Pils. (type *N. tantilla*, Gld.) In this latter group two sections are defined *Nesopupa* ss., and *Lyropupa*, nov. (type *N. lyrata*, Gld.).

Pilsbry, Henry A.—Additions to the Japanese Land snail fauna—II. Proc. Acad. Nat. Sci. Phila., 1900, pp. 443—448, pl. xiv.

The new forms are *Clausilia hakonensis*, *C. awajiensis*, *C. subaurantiaca*, *C. aulacophora*, *C. hirasci*, *C. hyperoptyx*, and *C. japonica* var. *surugae*.

Ihering, H. von.—On the South American Species of *Mytilidae*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 84—98.

Dr. von Ihering here gives an excellent summary and classification of the American *Mytilidae*, a family which embraces two very difficult genera—*Mytilus*, L., and *Modiolus*, Lam. This family has previously attracted the attention of one of the most distinguished students of the *Pelecypoda*, Dr. W. H. Dall; and is now no less fortunate in having so able an exponent as the author of the present paper.

The great reliance which has been placed upon the position of the umbones, and the presence or absence of teeth, is here regarded in a much less important light; and the sculpture of the shell, and the presence or absence and position of the shell muscles are taken into consideration. In this particular feature the author differs from Dr. Dall; but it should be remembered that since part 4 of the "Tertiary Fauna of Florida" was published (1898), Dr. Dall himself is less inclined to attach the same importance to such characters, indeed, judging by his very apt remarks upon the "dentition" of the hinge in the *Leptonacca* (see this Journal p. 76), such characters are quite secondary.

While the present grouping seems to be an advance on any previously published, we must confess our surprise that all the characters of the actual mollusc, excepting the shell muscles, are entirely ignored. It is surely very evident that shell characters alone are unreliable, and we doubt very much if upon such, we can ever expect to see a classification which will indicate the phylogenetic relationships of any class or group of molluscs.

The following subgenera are new: *Eumytilus*, n. n. (= *Mytilus*, s. s.), type *M. edulis*, L.; *Trichomya*, type *M. hirsutus*, Lam.; *Eumodiolus*, n. n. (= *Modiolus*, s. s.), type *M. modiolus*, L.—W. E. C.

GENERAL REVIEWS.

A Treatise on Zoology.—Edited by E. Ray Lankester.—Pt. ii. The Porifera and Coelentera. By E. A. Minchin, G. Herbert Fowler, and Gilbert C. Bourne. With an Introduction by E. Ray Lankester. 8vo, pp. vi+37+178+81+84+25. London: 1900. Adam and Charles Black.

The second volume of this valuable work well sustains the high standard which characterised volume i. In the present volume there are six chapters, the first, by Prof. Ray Lankester, treating of the Enterocoela and Coelomocoela, will be welcomed by all zoologists as a masterly exposition of a difficult subject. After emphasising the physiological importance of the coelom, the history of our knowledge of the subject is dealt with, together with its relations to the vascular and excretory systems. The nephridia of the Platyhelminia, Nemertina, Rotifera, Chaetopoda, and embryonic Mollusca are shown to be of ectodermic origin, whilst in the remaining phyla these have been replaced by uropoëtic coelomducts, which are parts of the coelomic wall itself.

The next chapter is devoted to the Porifera. Prof. Minchin groups these under three classes, viz. :—Calcarea, Hexactinellida, and Demospongiae. The portion devoted to this perplexing group takes up nearly half of the volume, and is by far the most comprehensive and detailed account that has yet been given in any English text-book.

Dr. Fowler ably treats of the Hydromedusae and Scyphomedusae in the two following chapters.

The Anthozoa and Ctenophora, dealt with by Mr. Bourne, concludes the volume.

Most of the illustrations are new, and all are excellent. At the end of each chapter is a carefully prepared bibliography, and a complete index.

The issue of volume ii only serves to emphasise the completeness of Prof. Ray Lankester's conception; while the comprehensive nature of this great work makes it indispensable to all teachers and advanced students, and a necessity in every public and scientific library.—W. E. C.

Descriptive and Illustrated Catalogue of the Physiological Series of Comparative Anatomy contained in the Museum of the Royal College of Surgeons of England. Vol. i. Second edition, pp. 1+160, pls. i—xiv, and 4 figs. in text. London: 1900. Taylor and Francis.

Prof. Charles Stewart and his able assistants, are to be heartily congratulated upon the appearance of this beautiful and intensely interesting volume. The subjects dealt with are the "Endoskeleton," "Flexible Bonds of Union and Support," and "Muscular and Allied Systems." The entry of each preparation bears a registration number, and in many cases a useful bibliographic reference; while in all cases the descriptions are wonderfully clear and concise. Very many of the preparations are new, and as near perfection as possible. This work should be in the hands of the Curator of every Natural History Museum in the country, it will at least show so far as a catalogue can, what can be done to illustrate Animal and Plant Structure, when the institution is guided and directed by a competent and qualified chief, even if he does not possess the rare curatorial genius of Prof. Stewart.

The work is illustrated by fourteen plates, mostly coloured, and while very beautiful, many fall a long way behind, so far as reproduction is concerned, those of continental lithographers.

We eagerly look forward to the publication of other volumes.—W. E. C.

A Monograph of Christmas Island (Indian Ocean): Physical Features and Geology. By Charles W. Andrews, with descriptions of the Fauna and Flora by numerous contributors, pp. xv+237, 21 pls., map, and figs. in text. London: 1900. Published by order of the Trustees of the British Museum.

Christmas Island represents an area of about 43 square miles, and is situated about 190 miles from the nearest land, the intervening ocean attaining a depth of over 3 miles. Its limited fauna, it would seem, has been derived from the Sunda Archipelago, of which it probably once formed a part.

The account of the recent mollusca has been written by Mr. Edgar A. Smith, who described 11 different forms from this island in 1888, 9 of which have been collected by Mr. Andrews, besides single specimens of *Opus subula*, *Melampus castaneus*, and *Assiminea andreausiana*, nn. spp. Seven of the 14 recorded species are peculiar to this island, but "they belong to genera the species of which have no very striking characters." All the species are figured.

The fossil mollusca, from the reef-limestones, are described by Mr. R. Bullen Newton. The identifications that have been possible would seem to indicate the modern character of these shells.

The work is illustrated by 22 plates, many of which are coloured, a map, and numerous figures in the text. All concerned in the production of this interesting volume are to be congratulated.—W. E. C.

INDEX TO VOLUME VII.

A.	PAGE	C.	PAGE
Abnormalities in the teeth of the radula of land shells.	51	Canary Islands. . Note on Helicoid Land Shells from	127
<i>Acroptychia pyramidalis</i> , n. sp. (fig.)	165	Carnarvonshire. Additional records to the Mollusca of	91
<i>Agriolimax laevis</i> , new variety.	21	Caroline Islands. The Land Shells of	101
<i>Amalia sowerbii</i> , Fér., v. <i>flavescens</i> , n. var.	17	<i>Cassia booleyi</i> , n. sp. (fig.)	162
<i>Amalia sowerbii</i> , Fér., <i>nigrocarinata</i> , n. var.	17	<i>Cataulus greeni</i> , n. sp. (fig.)	30
<i>Amalia sowerbii</i> , Fér., v. <i>plumbca</i> , n. var.	17	<i>Cataulus nietneri</i> , G. & H. Nev. Two new varieties of	85
<i>Anadenus dautzenbergi</i> , n. sp. (fig.)	134	<i>Cataulus nietneri</i> var. <i>capitata</i> , n. var. (fig.)	86
<i>Anadenus sechuenensis</i> , n. sp. (fig.)	78	<i>Cataulus nietneri</i> var. <i>unicolor</i> , n. var. (fig.)	86
Anatomy and Systematic position of some recent additions to the British Museum Collection of Slugs.	77	Ceylon. New Land Shells from	26
<i>Anodonta cygnea</i> , L. On some malformed specimens of	136	<i>Ceylon</i> . Varieties of <i>Cataulus nietneri</i> , from	85
<i>Anodonta cygnea</i> , L. On some further malformed specimens of	177	<i>Charopa kubaryi</i> , n. sp.	110
<i>Arion empiricorum</i> , Fér., Dimensions of some	16	<i>Charopa ponapica</i> , n. sp.	110
<i>Arion empiricorum</i> , Fér., var. <i>bocagei</i> , Simr.	33	<i>Charopa ualanensis</i> (Pease) em.	109
B.		China. List of small collection of Shells from	157
Bloomer, H. H.—“Literature on the anatomy of the <i>Solenidae</i> .”	16	China. New species of <i>Anadenus</i> from	133
—“Additional records to the Mollusca of Carnarvonshire and Merionethshire.”	91	<i>Clausilia granulosa</i> , n. sp. (fig.)	166
—“On some malformed specimens of <i>Anodonta cygnea</i> , L.”	136	Cockerell, T. D. A.—“Note on the Asiatic species of <i>Philomycus</i> .”	127
—“Notes on some further malformed specimens of <i>Anodonta cygnea</i> , L.”	177	Collet, O.—“On two new varieties of <i>Cataulus nietneri</i> , G. & H. Nev., from Ceylon.”	85
Breden, G.—“On the dimensions of some <i>Arion empiricorum</i> , Fér.”	16	Collinge, Walter E.—“Introduction.”	1
<i>Buliminus (Petracus) somaliensis</i> , n. sp. (fig.)	59	—“Description of a new species of <i>Cryptosoma</i> (<i>C. austeni</i>).”	2
		—“ <i>Limax variegatus</i> , Drap., var. <i>rufescens</i> , Moq., in Warwickshire.”	16
		—“Slugs from North Devon.”	16
		—“ <i>Agriolimax laevis</i> , new variety.”	21
		—“On the occurrence in	

	PAGE		PAGE
Ireland of <i>Arion empiricorum</i> , Fér., var. <i>bocagei</i> , Simr.	33	Ellis, H. Willoughby.—“Note on <i>Helix rufescens</i> .”	170
— “On the anatomy and systematic position of some recent additions to the British Museum collection of Slugs.”	77	<i>Endodonta</i> (<i>Thaumatodon</i>) <i>calli- zona</i> , n. sp. (fig.)	110
— “Description of a new species of <i>Anadenus</i> from China.”	133	<i>Endodonta</i> (<i>Ptychodon</i>) <i>urewera- ensis</i> , n. sp. (fig.)	53
— “G. Sherriff Tye.”	146	<i>Ennea</i> and <i>Leptopoma</i> . Note on the species of	26
— “The genus <i>Histiopsis</i> , Hoyle, preoccupied.”	147	<i>Ennea somaliensis</i> , n. sp. (fig.)	58
— “On some large speci- mens of <i>Valvata piscinalis</i> .”	170	<i>Eulota</i> (<i>Eulotella</i>) <i>micronesica</i> , n. sp.	110
— “Description of a new species of <i>Veronicella</i> from the Fiji Islands.”	179	F.	
— “Note on the <i>Gacotis</i> <i>douvillei</i> of de Morgan.”	179	Fiji Islands. Description of a new species of <i>Veronicella</i> from	179
— and Partridge, F. J.— “Note on some Slugs from Teneriffe.”	38	<i>Flammulina</i> (<i>Calymna</i>) <i>nigrescens</i> , n. sp.	107
Cooke, A. H.—“In Memoriam: M. H. Crosse.”	4	Fowler, H. V.—“Mollusca of Grange-over-Sands, Lancashire.”	38
— “ <i>Phasianella</i> “pulla” or “pullus?”	31	G.	
— “Notes on the nomen- clature of the British Nudi- branchiata, with a detailed classification of the group.”	59	<i>Gacotis douvillei</i> of de Morgan.	179
<i>Corbicula</i> sp.	160	Note on the	
Corrigenda	147	<i>Georissa rufula</i> , n. sp.	121
Crosse, M. H.	4	Grange-over-Sands, Lancashire. Mollusca of	38
<i>Cryptoplax</i> . On the occurrence of — in South Africa. (fig.)	164	Gude, G. K. — “Species of <i>Plec- topylis</i> recently described in “Science Gossip.”	7. 34
<i>Cryptosoma austeni</i> , n. sp. (fig.)	2	— “On the relative claim to priority of <i>Papuina wieg- manni</i> and <i>P. tuomensis</i> .”	88
<i>Cyathopoma innocens</i> , n. sp. (fig.)	29	— “Notes on some speci- mens of <i>Plectopylis</i> .”	91
<i>Cyclophorus binoyae</i> , n. sp. (fig.)	29	— “Note on Helicoid Land Shells from the Canary Is- lands.”	127
<i>Cyclophorus rescus</i> , n. sp. (fig.)	29	— “Notes on the genus <i>Sesara</i> , Alb., with descriptions of two new forms.”	139
D.		— “Description of a new variety of <i>Isomeria subcas- tanea</i> , Pfr.”	144
Description of <i>Acroptychia pyra- midalis</i> , n. sp. (fig.)	165	H.	
Description of <i>Clausilia granulosa</i> , n. sp. from Peru. (fig.)	166	Hawaiian Islands. New species of <i>Mitra</i> from	67
Description of a new species of <i>Cryptosoma</i> .	2	<i>Helicina</i> (<i>Sulfurina</i>) <i>carolinarum</i> , n. sp.	121
Description of two new species of Shells.	162	Helicoid Land Shells. Note on	127
Description of a new species of <i>Veronicella</i> from the Fiji Islands.	179	<i>Helix</i> (<i>Epipragmophora</i>) <i>kelletti</i> , Forbes. Habitat of	87
Devon. Slugs from North	16	<i>Helix lapicida</i> , L., mons. <i>sinistror- sum</i> , nov.?	180
E.		<i>Helix rufescens</i> . Note on	170
Editor's Notes. 24. 48. 76. 100. 132. [156.			

	PAGE
<i>Histiopsis</i> , Hoyle, preoccupied.	
The genus	147
<i>Hyalinia glabra</i> , Studer. Specific position of	25
<i>Hygromia revelata</i> . New locality for	16

I.

<i>Idas</i> . Note on the genus	169
Introduction.	1
<i>Ichnochiton</i> . On a three valved (fig.)	164
<i>Isomeria subcastanea</i> , Pfr. New variety of	144
<i>Isomeria subcastanea</i> v. <i>kobeltiana</i> , n. var. (fig.)	145

K.

<i>Kaliella colletti</i> , n. sp. (fig.)	30
----------------------------------------------------	----

L.

<i>Lagochilus occultus</i> , n. sp. (fig.)	28
<i>Leptopoma</i> . Notes on the species of	26
<i>Limax variegatus</i> , Drp., var. <i>rufescens</i> , Moq.	16
Lugunor (Mortlock). Land Shells of	125

M.

Mariannes. Land Shells of	122
Marshall, J. T.—“On a British species of <i>Myrina</i> , with a note on the genus <i>Idas</i> .”	171
Melvill, J. Cosmo.—“Description of a new species of <i>Mitra</i> (<i>M. baldwinii</i>) from the Hawaiian Islands.”	67
Merionethshire. Additional records to the Mollusca of	91
<i>Mitra baldwinii</i> , n. sp. (fig.)	67
Moellendorff, O. F. von.—“The Land Shells of the Caroline Islands.”	101
Moss, W.—“The specific position of the reputed British <i>Hyalinia glabra</i> , Studer.”	25
<i>Murex marcoensis</i> , n. sp. (fig.)	162
<i>Myrina</i> . On a British species of	167
<i>Myrina simpsoni</i> , n. sp. (figs.)	168
<i>Mytilus</i> sp.	160

N.

New Zealand. Malacological communications from	49
----------------------------------------------------------	----

	PAGE
New Zealand. On some — species of <i>Trophon</i>	55
Nomenclature of the British Nudibranchiata. Notes on the	59
North Devon. Slugs from	16
Nudibranchiata. Classification of the	65
Nudibranchiata. Notes on the nomenclature of the British	59

O.

Obituary.	48. 76. 100. 132. 146
<i>Opeas pruinosum</i> , n. sp.	114

P.

<i>Papuina wiegmanni</i> and <i>P. tuomensis</i> . On the relative claim to priority of	88
Partridge, F. J.—“ <i>Helix lapicida</i> , L., mons. <i>sinistrorsum</i> , nov.?”	180
— see also Collinge, W. E.	
<i>Partula rufa</i> sub-sp. <i>grandis</i> , nov.	112
<i>Partula rufa</i> sub-sp. <i>montana</i> , nov.	112
<i>Paryphanta</i> and <i>Rhytida</i> . On the carnivorous genera	49
Pelews. Land Shells of	122
Peru. Description of <i>Clausilia granulosa</i> , n. sp. from	166
<i>Phasianella</i> “ <i>pulla</i> ” or “ <i>pullus</i> ”?	31
<i>Philomyces</i> . Note on the Asiatic species of	127
<i>Plectopylis achatina</i> var. <i>infrafastigiata</i> , Gude. (fig.)	36
<i>Plectopylis achatina</i> var. <i>obesa</i> , Gude. (fig.)	35
<i>Plectopylis achatina</i> var. <i>venusta</i> , Gude. (fig.)	37
<i>Plectopylis blanda</i> , Gude. (fig.)	34
<i>Plectopylis leuochila</i> , Gude. (fig.)	13
<i>Plectopylis lissochlamys</i> , Gude. (fig.)	11
<i>Plectopylis magna</i> , Gude. (fig.)	9
<i>Plectopylis muspratti</i> , Gude. (fig.)	7
<i>Plectopylis perrieræ</i> , Gude. (fig.)	14
<i>Plectopylis stenochila</i> var. <i>basilia</i> , Gude. (fig.)	9
<i>Plectopylis trochospira</i> var. <i>bohollensis</i> , Gude. (fig.)	34
<i>Plectopylis</i> . Notes on some specimens of	91
Ponape. Land Shells of	125
Proceedings of the Midland Malacological Society 17. 39. 68. 91. [127. 148. 171. 181.	
<i>Purpura scobina</i> , Q. & G., v. <i>rutila</i> , n. var.	55

Q.	PAGE	T.	PAGE
<i>Quadrasiella ammonitella</i> , n. sp.	119	<i>Tebennophorus</i> , Binn.	80
R.		<i>Tebennophorus australis</i> , Bergh. (fig.)	80
Radula. Abnormalities in the teeth of	51	<i>Tebennophorus bilineatus</i> , Bens. Anatomy of	83
Ruk (Hogolu). Land Shells of	125	<i>Tebennophorus bilineatus</i> , Bens. (fig.)	80
S.		Teneriffe. Note on some Slugs from	38
<i>Scalaria</i> . On Clessin's new species of — from New Zealand.	53	<i>Tornatellina ovatula</i> , n. sp.	114
<i>Sesara</i> . Notes on the genus	139	<i>Tornatellina pusilla</i> , n. sp.	114
<i>Sesara harmeri</i> , n. sp. (fig.)	139	<i>Trochomorpha kuesteri</i> sub-sp. <i>intermedia</i> , nov.	105
<i>Sesara harmeri</i> , v. <i>anodonta</i> , n. var. (fig.)	140	<i>Trochomorpha kuesteri</i> sub-sp. <i>transilans</i> , nov.	104
Slugs. Additions to British Mu- seum collection of	77	<i>Trophon ambiguus</i> (Phil.) v. <i>pumila</i> n. var.	55
Slugs from North Devon.	16	<i>Trophon</i> . On some New Zealand species of	55
Slugs. Note on some — from Teneriffe.	38	Tye. G. Sherrieff. Obituary.	146
Smith, Edgar A.— "On some Land Shells from Somaliland."	57	U.	
— "A list of a small col- lection of shells from China."	157	Ualan. Land Shells of	125
<i>Solenidae</i> . Literature on the An- atomy of the	16	<i>Unio</i> sp.	160
Somaliland. On some Land Shells from	57	V.	
South Africa. On the occurrence of <i>Cryptoplax</i> in	165	<i>Valvata piscinalis</i> . Large speci- mens of	170
Sowerby, G. B.— "Descriptions of two new species of Shells: <i>Murex marcoensis</i> and <i>Cassia booleyi</i> ."	162	<i>Veronicella gilsoni</i> , n. sp.	
<i>Subulina octona</i> , Chemn., in Kew Gardens.	91	<i>Vertigo</i> (<i>Ptychochilus</i>) <i>ponapica</i> , n. sp.	113
Suter, Henry. — "Malacological communications from New Zealand."	49	<i>Vivipara</i> sp.	158
Sykes, E. R.— "Notes on the species of <i>Ennea</i> and <i>Lepto- poma</i> recorded from Ceylon, with descriptions of some new Land Shells from that island."	26	<i>Vivipara auriculata</i> , Marts. (fig.)	159
— " <i>Subulina octona</i> , Chemn., in Kew Gardens."	91	<i>Vivipara wingatei</i> , n. sp. (fig.)	158
— "Malacological Notes."	164	W.	
		Warwickshire. <i>Limax variegatus</i> , Drap., var. <i>rufescens</i> , Moq., in	16
		Williamson, M. Burton.— " <i>Helix</i> (<i>Epipragmophora</i>) <i>kelletti</i> , Forbes, and its habitat."	87
		Woodward, B. B.— "New local- ity for <i>Hygromia revelata</i> ."	16
		Y.	
		Yap. Land Shells of	125

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Contents.

	PAGE
Introduction	W.E.C. 1
Description of a new Species of <i>Cryptosoma</i> (<i>C. austeni</i>)	By Walter E. Collinge, F.Z.S. 2
In Memoriam: M. H. Crosse	By the Rev. A. H. Cooke, M.A., F.Z.S. 4
Species of <i>Plectopylis</i> recently described in "Science Gossip"	By G. K. Gude, F.Z.S. 7
NOTES—Literature on the Anatomy of the <i>Solenidae</i>	By H. Howard Bloomer. 16
On the Dimensions of some <i>Arion empiricorum</i> , Fér.	By Guy Breeden. 16
New Locality for <i>Hygromia revelata</i>	By B. B. Woodward, F.G.S. 16
<i>Limax variegatus</i> , Drap., var. <i>rufescens</i> , Moq., in Warwickshire	By Walter E. Collinge, F.Z.S. 16
Slugs from North Devon	By Walter E. Collinge, F.Z.S. 16
Proceedings of the Midland Malacological Society	17
Current Literature	19

Editor's Notes.

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Contents.

	PAGE
The Specific position of the reputed British <i>Hyalinia glabra</i> , Studer. By W. Moss, F.C.A.	25
Notes on the species of <i>Ennea</i> and <i>Leptopoma</i> recorded from Ceylon, etc.	
By E. R. Sykes, B.A., F.Z.S.	26
<i>Phasianella</i> "pulla" or "pullus" By the Rev. A. H. Cooke, M.A., F.Z.S.	31
On the Occurrence in Ireland of <i>Arion empiricorum</i> , Fér., var. <i>bocagei</i> , Simr.	
By Walter E. Collinge, F.Z.S.	33
Species of <i>Plectopylis</i> recently described in "Science Gossip" By G. K. Gude, F.Z.S.	34
NOTES—Mollusca of Grange-over-Sands By H. V. Fowler, M.A.	38
Note on some Slugs from Teneriffe By Walter E. Collinge, F.Z.S., and F. J. Partridge.	38
Proceedings of the Midland Malacological Society	39
Current Literature :—Reviews by E. R. Sykes, B.A. ; Professor L. Joubin ; Professor, W. A. Hardman, D.Sc., F.R.S. ; Walter E. Collinge, F.Z.S. ; Brockton Tomlin, B.A. ..	40
Editor's Notes.	

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Contents.

	PAGE
Malacological Communications from New Zealand. By Henry Suter.	49
On some Land Shells from Somaliland. By Edgar A. Smith, F.Z.S.	57
Notes on the Nomenclature of the British Nudibranchiata.	
By the Rev. A. H. Cooke, M.A., F.Z.S.	59
Description of a new species of <i>Mitra</i> (<i>M. baldwini</i>) from the Hawaiian Islands.	
By James Cosmo Melvill, M.A., F.L.S.	67
Proceedings of the Midland Malacological Society.	68
Current Literature:—Reviews by E. R. Sykes, B.A.; S. S. Buckman, F.G.S.; B. B. Woodward, F.G.S.; G. C. Crick, F.G.S.; R. H. Burne, B.A., F.Z.S.; Walter E. Collinge, F.Z.S.	70
Editor's Notes.	

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Contents.

PAGE

On the Anatomy and Systematic position of some recent additions to the British Museum Collection of Slugs.	By Walter E. Collinge, F.Z.S.	77
On two new Varieties of <i>Cataulus nietneri</i> , G. & H. Nev., from Ceylon.	By Oliver Collett, F.R.M.S.	85
<i>Helix (Epipragmophora) kellettii</i> , Forbes, and its habitat.	By Mrs. M. Burton Williamson.	87
On the relative claim to priority of <i>Papuina wiegmanni</i> and <i>P. tuomensis</i> .	By G. K. Gude, F.Z.S.	88
NOTES— <i>Subulina octona</i> , Chemn., in Kew Gardens.	By E. R. Sykes, B.A., F.Z.S.	91
Notes on some Specimens of <i>Plectopylis</i>	By G. K. Gude, F.Z.S.	91
Additional Records to the Mollusca of Carnarvonshire and Merionethshire.	By H. H. Bloomer.	91
Proceedings of the Midland Malacological Society		91
Current Literature:—Reviews by E. R. Sykes, B.A., F.Z.S.; R. H. Burne, B.A., F.Z.S.; Professor W. A. Herdman, D.Sc., F.R.S.; W. E. Hoyle, M.A., F.R.S. Edin.; A. E. Boycott; Charles Hedley, F.L.S.; Walter E. Collinge, F.Z.S.		93
Editor's Notes.		

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Contents.

PAGE

The Land Shells of the Caroline Islands.	By O. F. von Moellendorff, Ph.D.	101
Note on Helicoid Land Shells from the Canary Islands.	By G. K. Gude, F.Z.S.	127
Note on the Asiatic species of <i>Philomycus</i>	By Prof. T. D. A. Cockerell, F.Z.S.	127
Proceedings of the Midland Malacological Society.		127
Current Literature:—Reviews by E. R. Sykes, B.A., F.Z.S.; Geo. C. Crick, F.G.S.; Walter E. Collinge, F.Z.S.		128
General Reviews:—Parker and Haswell's Manual of Zoology.		132
Davenport's Statistical Methods.		132
Editor's Notes.		

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No. 5.

MARCH, 1900.

VOL. VII.

Contents:

	PAGE
The Land Shells of the Caroline Islands.	
By O. F. von Moellendorff, Ph.D.	101
Note on Helicoid Land Shells from the Canary Islands.	
By G. K. Gude, F.Z.S.	127
Note on the Asiatic species of <i>Philomycus</i> .	
By Professor T. D. A. Cockerell, F.Z.S.	127
Proceedings of the Midland Malacological Society.	- - 127
Current Literature: Reviews by E. R. Sykes, B.A., F.Z.S. ;	
Geo. C. Crick, F.G.S. ; Walter E. Collinge, F.Z.S.	- - 128
General Reviews: Parker and Haswell's "Manual of Zoology."	132
Davenport's "Statistical Methods."	- - 132
Editor's Notes.	

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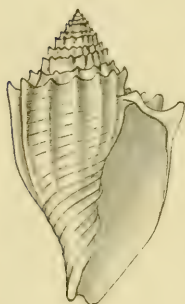
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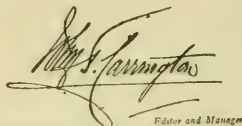
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Contents.

PAGE

Description of a new Species of <i>Anadenus</i> from China.	By Walter E. Collinge, F.Z.S.	133
On some Malformed specimens of <i>Anodonta cygnea</i> , L.	By H. H. Bloomer.	136
Notes on the Genus <i>Sesara</i> , Alb., with descriptions of two new forms.	By G. K. Gude, F.Z.S.	139
Description of a new variety of <i>Isomeria subcastanea</i> , Pfr.	By G. K. Gude, F.Z.S.	144
Obituary Notices: G. Sherriff Tye, etc.	W. E. C.	146
The Genus <i>Histiopsis</i> , Hoyle, preoccupied.	W. E. C.	147
Corrigenda.		147
Proceedings of the Midland Malacological Society.		148
Current Literature. General Reviews.		149

Editor's Notes.

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Contents.

	PAGE
A List of a small collection of Shells from China.	157
Descriptions of two new Species of Shells: <i>Murex marcoensis</i> and <i>Cassia booleyi</i> . By Edgar A. Smith, F.Z.S.	162
Malacological Notes.	164
On a British species of <i>Myrina</i> , with a Note on the Genus <i>Idas</i>	167
NOTES:	
On some large specimens of <i>Valvata piscinalis</i>	170
Note on <i>Helix rufescens</i>	170
Proceedings of the Midland Malacological Society.	171
Current Literature.	171

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In view of the larger number and size of papers which the Journal has recently been honoured with, it is very desirable that the number of pages should be increased, but unless I am in part relieved of the heavy cost entailed by the plates and figures, I do not feel justified in adding to the already heavy deficit.

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Contents.

	PAGE
Notes on some further malformed specimens of <i>Anodonta cygnea</i> , L.	By H. H. Bloomer. 177
Description of a new species of <i>Veronicella</i> from the Fiji Islands.	By Walter E. Collinge. 179
Note on the <i>Gaeotis douvillei</i> of de Morgan.	By Walter E. Collinge. 179
<i>Helix lapicida</i> , L., mons. <i>sinistrorsum</i> , nov.?	By F. J. Partridge. 180
Proceedings of the Midland Malacological Society.	181
Current Literature.	182
General Reviews.	187
Title Page, Contents, Index, etc. to Volume VII.	

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